NATURE, NURTURE, AND TEMPERAMENT: COMPARISONS OF TEMPERAMENT STYLES DISPLAYED BY U.S. STUDENTS

By

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Temperament preferences displayed by U.S. students ages 8 through 17 were examined. Temperament styles of 7,902 U.S. males and females were compared to identify possible age and gender differences in temperament preferences. In general, both male and female students prefer extroversion to introversion, imaginative to practical, and organized to flexible styles. Males prefer a thinking style while females prefer a feeling style.

From a developmental perspective, preferences for an extroverted style increase between ages 8 and 13 and decrease thereafter. A shift from an initially balanced perspective on the practical-imaginative dimension toward an increase in preferences for an imaginative style is evident between ages 8 and 10. A return toward a more balanced perspective on the practical imaginative dimension occurs between ages 10 and 15. Preferences for an imaginative style increase again between ages 15 and 17. The

prevalence of a thinking style among males generally is stable between ages 8 and 17. In contrast, age level differences in the direction of an increasingly stronger preference for a feeling style are evident among females. A shift from an initially strong preference for an organized style toward a more balanced perspective that includes both organized and flexible styles is evident between ages 8 and 15. A return to a preference for an organized style is observed between ages 15 and 17. Biological and cultural explanations were considered in interpreting the findings. Results were compared with existing data in related adult-based literature.

CHAPTER 1
INTRODUCTION

Interest in temperament probably is as old as mankind. Notions about differences in temperament are found in the ancient writings of eastern and western philosophers, narratives of writers and historians, and abstracts of present day researchers and experimenters. Various terms and concepts have been used to describe and explain obvious interpersonal differences. For example, temperament has been described, among other things, as dispositions, character, behaviors, styles, abilities, motivations, emotions, and personality. "This state of affairs has led to some confusion for scholars who seek to offer an overview of the field of temperament research" (Garrison & Earls, 1987, p.13), especially when relating the concept of temperament to personality. Temperament qualities have been of interest, in part, because of expectations that they may influence the development of personality (Rutter, 1987).

Given the absence of a consensus construct and definition for temperament, temperament commonly has been defined operationally, based on the particular approach of a researcher (Hubert, Wachs, Peters-Martin, & Gandour, 1982). Indeed, a roundtable discussion of eight contemporary researchers offered eight different definitions of temperament (Goldsmith et al., 1987). However, several points of convergence exist among contemporary temperament theories (Goldsmith & Rieser-Danner, 1986).

Points of Convergence

Temperament is an inclusive term referring to several dimensions of behavior characterized by individual differences. Most temperament characteristics appear early in life and form the foundation upon which personality characteristics later emerge. Temperament dimensions are relatively stable across time and context. Although temperament traits have a strong biological basis, their expression can be influenced by contextual factors and personal choice (Goldsmith & Rieser-Danner, 1986).

Points of Divergence

Issues representing points of divergence among contemporary theories also can be identified: the actual dimensions of temperament, the role and emphasis of biological factors in the determination of temperaments, the role of motivation in temperament, the fundamental definitions of temperament-especially at the behavioral and psychophysiological level, the role of temperament in behavior, the role of contextual influences on temperament, and relationships between temperament and personality (Goldsmith & Rieser-Danner, 1986).

Convergence Revisited

While one accepted construct of temperament may not exist, the essential rationale for studying a concept such as temperament is entrenched firmly. The fundamental significance of temperament lies in its proposed role as a biologically-rooted determinant of personality. Tegalsi (1998a) states:

> The identification of temperament traits fills a gap in our understanding of human development and. . . . the idea that individuals influence their own development by bringing unique attributes to their experiences contrasts the view of children as "blank slates" to be inscribed by the environment. By assuming a bidirectional interplay among intrinsic attributes of a person and external demands, supports, and circumstances, temperament theory supports

> the widely accepted assumption that development is propelled by the person and environment interaction. (Lewin, 1935, cited in Tegalsi, p. 475)

Utility of Understanding Children's Temperament

The person-environment schema implies that those who are responsible for children may foster their development with an understanding of temperament theory. Mental health professionals, medical practitioners, educators, parents, and other caregivers who use temperament theory may be more sensitive to the needs of individual children. This belief is reflected in the following statement by McClowry (1998):

> Many children's behavioral problems, according to temperament theory, could be averted if the environment provides goodness of fit, which is achieved when demands, expectations, and opportunities are consonant with the child's development (Chess & Thomas, 1984). Parents and other caregivers of children with challenging temperaments are often relieved to learn that some children require considerably more effort to rear than others do. Once this insight is achieved self-blame is reduced and caregivers can redirect their energies to resolving the conflict their child has with his/her social environment. (Bates, Wachs, & Emde, 1994, cited in McClowry, p. 553)

An illustration of the positive effects of goodness of fit on later personality has been provided by Wachs (1994). The inhibited child who experiences a social environment with sensitive parents that lets the child set one's own pace, a physical environment with "defensible spaces" to which the child can retreat, peer groups with other inhibited children and common interests, and a school environment that is "undermanned" so the child is tolerated and feels one makes a contribution, is likely to develop into a healthy adult with behavioral manifestations close to extraversion and emotional stability.

However, the inhibited child who encounters controlling parents, chaotic environments that allow no escape from stimulation, peer groups that reject the child,

and an "overmanned" school where the child is less tolerated and does not feel valued is likely to develop behavioral manifestations of neuroticism.

While the examples provided above are hypothetical, evidence supports the notion that consonance between the person and environment, or goodness of fit, promotes optimal development (Chess & Thomas, 1996).

Taken as a whole, goodness of fit appears to be important for understanding children's experiences in school (Keogh, 1986). Given the importance of school psychologists in the development of educational programs for children, the conclusion that school psychologists can play a key role in promoting goodness of fit in school settings is reasonable. This implies that a school psychologist's assessment, intervention, and consultation efforts with teachers and parents are informed by knowledge about children's temperament styles.

Assessment

From a psychoeducational assessment perspective, assessment of children and youth traditionally has been limited to variables of cognitive ability, academic skills, and behavior problems (Martin, 1994). While important to understanding children's progress, these domains are insufficient for describing the child's behavioral style. A school psychologist's primary goal is to accurately describe the child and provide a realistic picture of the child's developmental trajectory (Martin, 1994). The inclusion of temperament measures in a psychologist's assessment battery provides avenues for evaluating styles, predicting future performance and behavior, and developing interventions that can improve school experiences for students and teachers (Carey, 1998; Keogh, 2003; McClowry, 1998; Tegalsi, 1998b).

Interventions

Goodness of fit theory infers that school psychologists move beyond exclusive focus on the assessment of the child and into the child's learning environments to understand how social and physical contextual variables interact with the child's temperament (Keogh, 1989), leading to the development of environments that are consistent with a child's needs (Martin, 1994). Additionally, awareness of temperament differences may provide teachers important information about students' learning styles that may be used to enhance environments where learning occurs. For example, the extroverted child may be provided opportunities to work in cooperative groups whereas the introverted child may be allowed to work independently.

Consultation

When consulting with caregivers, school psychologists can provide temperament information that may have a profound effect on clarifying or enhancing relationships between the consultee and child, especially with children displaying a difficult style. Consultee knowledge that children's behavior may be biologically rooted may reduce self-blame or blaming the child for challenging and seemingly willful behavior (Tegalsi, 1998b). Furthermore, "acknowledging that some temperament characteristics are challenging for caregivers normalizes some of the frustrations experienced in caring for the child" (Tegalsi, 1998b, p. 580). Thus, an understanding of children's temperament characteristics may help caregivers develop realistic expectations, leading to reduced stress in situations in which the caregiver's requirements are inconsistent with the child's behavioral style (Carey, 1998). Moreover, through a consultative relationship, teachers may be able to identify and develop a

wider range of instructional and management strategies that are more responsive to children's learning styles.

The purpose of this study is to describe and explain possible developmental change and stability of temperament preferences displayed by U.S. male and female students age 8 through 17. An overview of historical perspectives on the construct of temperament is provided. Contemporary theories are reviewed and how various developmental and gender considerations flow from the theoretical orientations are discussed. The research questions that guide the study are set forth. The methods used to conduct the investigation are described. The dissertation will conclude with a results section and a discussion of the findings.

CHAPTER 2
REVIEW OF LITERATURE

Ancient and Pre-Modern Perspectives

In *Psychology of Character* (1927), Roback wrote, "the ancients have given evidence of an uncanny insight in many of the scattered observations on both character and temperament" (p. 4). Roback probably was referring to the contributions of such ancient Greeks as Hippocrates, Plato, and Aristotle. Hippocrates seemingly first recorded notions about temperament around 350 B.C. in *On the Nature of Man.* He wrote of four humors or temperaments that were associated with body fluids: black and yellow bile, phlegm, and blood. These humors were thought to control the whole existence and behavior of mankind. An individual's character and health were determined according to the manner in which the humors were combined.

A generation later, Plato and Aristotle each described four types of character akin to Hippocrates' temperaments (Keirsey, 1998). Galen, around 200 A.D., ultimately delineated a theory of temperament that would remain influential through the nineteenth century (Strelau, 1998). Galen described a quartet of temperament styles derived from Hippocrates' humors: the melancholic, sanguine, choleric, and phlegmatic styles. These styles resulted from an excess of one of the bodily fluids. The melancholic person, always serious and downcast, owed his nature to an excess of black bile. Sanguine's impulsivity and enthusiasm was thought to be due to the strength of his blood. The choleric's ease of irritability and sensitivity was traced to the influence of yellow bile.

The phlegmatic person's slowness and impassivity were attributed to the predominance of the phlegm (Roback, 1927).

During the Middle Ages, Galen's humoral doctrine penetrated everyday life. Moreover, his concept of the four temperaments made a deep impression among some Renaissance and Enlightenment scholars. For example, Paracelsus, a mid-sixteenth century physician, described four human natures that were comparable to Galen's temperament types (Keirsey, 1998), despite the fact he disputed Galen's interpretations of Hippocrates' writings. Literary greats, including Shakespeare and his contemporary, Ben Jonson, made numerous references to the humors in their plays. Philosophers during the Enlightenment period (e.g., Bruno, Hume, Voltaire, Rousseau, and Kant) did not question the use of humoral theory (Keirsey, 1998).

Nevertheless, the widespread acceptance of Galen's inborn predispositions did not go entirely unchallenged. As an omen of things to come, the great British empiricist John Locke (1690/1979) wrote in an oft-quoted passage from his *An Essay Concerning Human Understanding*:

> Let us suppose the mind to be, as we say, white paper, void of all characters, without any ideas: - How comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer, in one word, from experience.

Galen's views gradually began to erode around the time of the American and French revolutions (Kagan, 1994a). Another Greek design, democracy, captured the attention of the western world. With it came a shift in thinking that stood in direct contrast to Galen's inborn temperament types: people were fundamentally alike rather than different. The idea of innate differences in humans, as Galen described, was

thought by some to violate the democratic principle of egalitarianism. People were conceived to be essentially alike, to be molded by their experiences. These ideas had particular meaning to the new middle class whose aspirations for power and influence now could be realized legitimately (Kagan, 1994a). By the end of the nineteenth century, inquiry into the nature of persons emphasized the influence of the environment in the development of character and personality. At about this time Sigmund Freud proposed his highly influential psychoanalytic theory of development that embraced early experience as a determinant of adult personality.

Environmentalism Undaunted

Freud developed a theory that described personality in terms of three components: the id, ego, and superego. During the development of the id, ego, and superego, the child proceeded through a sequence of five psychosexual stages. In each stage the child was faced with problems caused by the conflict of wanting to satisfy instincts, especially sexual desires, with the need to comply with the demands of society. Childhood events played a significant role in the resolution of these conflicts and, in turn, the acquisition of personality traits. For example, an infant deprived of satisfactions during the oral stage was likely to be gloomy, doubting, and somewhat pessimistic. Satisfaction of oral needs resulted in a self-assured personality with an optimistic outlook on life. Freud's inclusion of the environment as an influence on the development of personality was clearly distinct from the innately derived temperaments described by the Greeks a millennium earlier.

Many of Freud's contemporaries took issue with his focus on sexual instincts but retained his idea of a single motive for behavior. Alfred Adler, a colleague of

Freud's, replaced sexual instincts with a desire for superiority as the prime motivator in life. Adler proposed that man was born into the world feeling incomplete and unfulfilled. Feeling inferior, he was motivated to emulate the strength and capabilities of others. Once having attained those capacities, he again felt inferior. In order for man to achieve superiority, however temporary, it was necessary to conduct the self in a singular style of life. Style, or personality, was uniquely determined by forces from the social environment that aided, interfered, or reshaped one's quest for superiority.

Harry Sullivan described a theory of personality that put forth anxiety reduction as the basic motive for behavior. Sullivan proposed that man was surrounded by feelings of anxiety the moment he entered life. Real or imagined anxiety situations were alleviated best by the formation of safe interpersonal relationships with nonanxious others. Over time, the number of relationships increased and interpersonal patterns eventually emerged to form the core of one's personality. Adler and Sullivan's theories lent further credence to the notion that the social environment was a primary molder of man.

Interest in the environment as the primary determinant of personality flourished in analytic circles during the remainder of the first half of the twentieth century. Eric Fromm concluded that the quest for self-preservation was shaped by parental and societal influences. Karen Horney reasoned that the human endeavor toward self-realization was either aided or blocked by experiences, at the crux of which were human relationships. Erik Erikson's theory of personality, based on the tenets of Freud, placed greater emphasis on the roles of society and culture on the formation of the ego.

About the time analytic approaches to personality development were enjoying their greatest popularity, the noted American behavioral psychologist, B.F. Skinner, sought to redefine personality theory as the study of human behavior. Emphatically rejecting hypothetical underlying causes of personality (e.g., instincts, feelings of inferiority or superiority, self-preservation, and self-realization) as described in analytic theories, Skinner believed psychology could become scientific only if it restricted its attention to observable behaviors. Based on principles from John Watson, Skinner concluded that all human behavior was learned through prior conditioning, that is, as a function of the forces of the external environment that reinforced behavior. Behavioral patterns are the lasting result of reinforcement schedules. Skinner's behaviorist approach departed significantly from the popular psychoanalytic theories. However, he also emphasized the role of environmental events in explaining human behaviors.

The idea of inborn dispositions was not abandoned altogether in the early twentieth century. Interestingly, Carl Jung, a psychologist well-known for his psychoanalytic orientation, revived interest in innately derived temperament types. Whereas many psychoanalysts of his era stressed childhood determinants of personality, Jung believed the newborn infant was by no means a tabula rasa.

Jungian Typology

Predating temperament theories developed latter in the twentieth century, Jung attributed individual differences in personality to a pair of inborn, possible genetic or physiological dimensions mediated by environmental influences. The first dimension concerned the direction of psychic energy and consisted of two attitudes: extraversion and introversion. The second dimension involved the apprehension of stimuli and

consisted of four mental functions: thinking, feeling, sensation, and intuition. From this point of view, Jung differentiated eight basic types of people. The following section provides a more detailed description of Jung's theory of psychological types.

Attitude types. In his now classic book, *Psychological Types*, Jung (1921/1971) distinguishes between two basic typological attitudes of extraversion and introversion. In general, attitude is conceived to be a state of psychological readiness in the individual to act or react in a certain direction.

Jung (1953) first took notice of attitudes when trying to understand why Freud's view of human psychology was so different from that of Adler. From Jung's perspective, Freud saw his patients as defining themselves in relation to significant objects in the environment, especially parents. Conversely, Adler saw his patients defining themselves in relation to a self-determined quest for supremacy. Thus, Freud stressed a movement of psychic energy toward the outer world; Adler stressed a movement of psychic energy toward the inner world or self. The contrasting perspectives of his contemporaries essentially laid the foundation for Jung's extraverted and introverted attitudes.

In the extraverted attitude, the movement of energy is toward the outer world (i.e., from the person to the object). The extravert's interest and attention follow events and activities in the immediate environment. Persons and things regulate the actions of the extravert. Moreover, the extravert's philosophy of life is governed by the collective standards of society. According to Jung, the extreme extravert is at risk of losing his or her own identity as a separate person.

In contrast, the introvert's movement of energy is toward the inner world (i.e., from the object to the person). Subjective factors are the chief determinant in the interest and attention of the introvert. Thus, personal decisions and convictions guide the introvert's actions and morality. The extreme introvert is at risk of retreating into a world of emotional and behavioral isolationism.

However, a pure and exclusive attitude never occurs (Jung, 1921/1971). Jung acknowledged that every individual possesses attitudes of extraversion and introversion. A healthy individual adapts in both ways, depending on one's suitability to the environment. For example, the introvert occasionally exhibits an extraverted orientation and vice versa. Indeed, most people probably can identify both introverted and extraverted behaviors in their personality (Spoto, 1989). Still, a healthy individual ultimately develops an attitude type consonant with his or her prevailing and preferred nature. This reasoning similarly applies under the discussion of function types.

Function types. Jung's early formulations of typology centered almost exclusively on the polarity of introverted and extraverted attitudes (Spoto, 1989). However, Jung eventually concluded that attitude alone was insufficient for explaining psychological types. Jung (1921/1971) wrote:

> I had tried to explain too much in too simple a way, as often happens in the first joy of discovery. . . . What struck me now was the undeniable fact that while people may be classed as introverts and extraverts, this does not account for the tremendous differences between individuals in either class. (p. 535)

Based on his many years of clinical experience, Jung (1953) ultimately concluded the existence of four mental functions (i.e., thinking, feeling, sensation, and intuition) in addition to the two attitudes. The functions are conceived to be forms of psychological orientation, each with its own area of expertise (Jung, 1921/1971).

The thinking function refers to the process of cognitive thought. It organizes and decides things based on analysis and logic. The feeling function refers to the process of subjective judgment. It organizes and decides things on the basis of values and individual worth. According to Jung, the thinking and feeling functions are characterized as rational (i.e., judging) functions because they are based on linear reasoning and judgment.

The sensation function refers to apprehension via the five sense organs. It operates primarily through experience of the physical world. The intuition function refers to apprehension through unconscious experience or instincts. Jung characterized both sensation and intuition as irrational (i.e., sensing) functions because they operate outside the realm of reasoning. In other words, perceptions by these functions simply happen upon one's self and are made independent of rational thought processes.

Here again, Jung acknowledged that every individual possesses each of the four mental functions. Further, the more developed each of the four functions, the more comprehensive the individual's understanding of the world. Indeed, Jung (1921/1971) stated:

> These four together produce a kind of totality. Sensation establishes what is actually present, thinking enables us to recognize its meaning, feeling tells us its value, and intuition points to its possibilities as to whence it came and whither it is going in a given situation. In this way we can orient ourselves with respect to the immediate world. (pp. 540-541)

Still, Jung (1921/1971) theorized that attempts to bring all psychological functions into simultaneous development are virtually impossible. Instead, the individual typically develops one superior function. The superior function ordinarily is that with which the individual is most gifted by nature. It possesses its own inherent

energy and is the most efficient means for one's social success. Specifically, it is the individual's preferred function.

Individuation and psychological type. The concept of individuation is perhaps the glue that binds one's psychological type. According to Jung (1921/1971), the goal of individuation is to develop one's innate dispositions so that the superior function combines with the dominant attitude. In this manner, the extraverted or introverted attitude is paired with one of the four mental functions to yield one of eight possible personality types.

If extraversion is the superior attitude, a person with a dominant thinking function will likely pursue a lifestyle according to intellectual considerations of objective facts. In a similar manner, the introverted thinking type also is concerned mainly with ideas, with the ideas springing from the subjective domain.

The extraverted feeling type is characterized by a desire to create harmonious conditions in the surrounding environment, particularly in social situations. The introverted feeling type also seeks harmony but is less concerned with the comfort and well-being of others. The introverted feeling type often appears to be silent and inaccessible.

The extraverted sensation type displays a strong inclination for objects and people in the environment that arouse the senses. This type is highly motivated by physical or concrete enjoyment. In a similar manner, the introverted sensation type also is concerned with physical sensitivity to objects and people but is subjectively oriented toward what is perceived.

The extraverted intuitive type is characterized by an extraordinary ability to see possibilities in external situations, especially the ideas and creations of others. The introverted intuitive type also possesses the uncanny ability to see the possibilities, although the visions are likely to originate from ideas and creations formulated within.

Falsification of type. A healthy personality emerges if the individuation process was not hindered by external forces or misguided attempts to make another attitude or function superior (Jung, 1921/1971). A child could be forced into assuming a type that violates the innate disposition under abnormal conditions (e.g., coercive parenting). The consequences of such a situation are deleterious (Jung, 1921/1946):

> As a rule, whenever such a falsification of type takes place as a result of external influence, the individual becomes neurotic later, and a cure can successfully be sought only in a development of that attitude which corresponds with the individual's natural way. . . . a reversal of type often proves exceedingly harmful to the physiological well-being of the organism, often provoking an acute state of exhaustion. (pp. 415-416)

Jung described a theory that included both innate dispositions and environmental factors in the determination of personality. His views were forerunners to the person-environment schema described in many contemporary temperament theories.

Current Perspectives

Myers-Briggs Theory

Around the time Jung was developing his theory of psychological types, Katherine Briggs was attempting to develop her own typology. Her interest in personality types was sparked when she noted that her daughter, Isabel Myers, had fallen in love with a man so different from others in the Briggs family. Thus, Briggs began reading a multitude of varied biographies in an effort to develop a typology based on the patterns she found. She first delineated four types: the meditative, spontaneous,

executive, and sociable. When Briggs discovered *Psychological Types*, she abandoned her own typology in favor of Jung's.

Working in the late 1940s and throughout the 1950s with the "belief that many problems might be dealt with more successfully if approached in the light of C.G. Jung's theory of psychological types" (Myers & Myers, 1980, p. xiii), Myers and Briggs developed their own conceptual framework of Jung's typology. Thus, although their framework is strikingly similar to Jung's theory, several modifications can be found.

They accepted the two attitudes to life (i.e., extraversion and introversion) and the four basic functions (i.e. sensing, intuition, thinking, and feeling) postulated by Jung. However, Myers split the functions into two dichotomized and separate qualities: sensing/intuition and thinking/feeling. She also added a fourth dimension: judging vs. perceiving. Thus, the test based on this model, the Myers-Briggs Type Indicator (MBTI), operatizes and describes individual differences along four temperament dimensions, resulting in sixteen types instead of Jung's eight types. Consistent with Jung's model, these temperament qualities are conceived to arise from inborn differences (Myers & Myers, 1980).

The attitudes of extraversion (E) and introversion (I) refer to ways people orient themselves to the world. In extraversion, energy flows outward, in action, to objects and people. In introversion, energy is directed inward, to reflection on thoughts, ideas, and concepts.

According to Myers and Myers (1980), the two modes of perception, sensing (S) and intuition (N), compete for a person's attention. One mode is preferred from infancy

onward. Sensing is the process of becoming "aware of things directly through our five senses" (p.2). The process of intuition is "indirect perception by way of the unconscious, incorporating ideas or associations that the unconscious tacks on to perceptions coming from outside" (p.2). Temperament traits associated with the preferred perspective emerge as the SN preference becomes more refined (Myers & Myers, 1980).

Myers also describes two modes of judging: thinking (T) and feeling (F). These two functions process the perceptions or information gathered to form judgments or decisions. Thinkers use logical analysis to make decisions while feelers use personal values and priorities. Myers and Myers (1980) noted "the child who prefers thinking develops along divergent lines from the child who prefers feeling, even when both like the same perception process and start with the same perceptions" (p.4).

The final and added dimension, judgment (J) and perception (P), Myers' most radical departure from Jung's typology, concerns the preferred "method of dealing with the world around us" (Myers & Myers, 1980, p. 8). The judger deals with the outside world with regiment and purpose whereas the perceiver is more flexible and adaptable. Importantly, users of type theory need to be clear that the judging/perceiving scale refers only to the manner in which one conducts the self in the external world, regardless of position on the extraversion/introversion dimension.

Like Jung, Myers concluded the environment impacts inborn differences along the dimensions. In this respect, experiences could be considered obstacles that discourage individuals from developing natural preferences (Myers & Myers, 1980). Examples of environmental obstacles include a lack of faith in one's own type due to its

infrequency in the general population, its lack of acceptance in one's environment, and a lack of opportunity or incentive to exercise one's favored process or attitude. On the other hand, Myers believed type development is encouraged when the environment met the needs of a child's native capacities.

Given the relative similarity in the conceptual frameworks of Jung and Myers and Briggs, one might be tempted to discount Myers and Briggs contributions to type theory. Such a perspective would be extremely short sighted. Importantly, with the creation of the Myers-Briggs Type Indicator (MBTI), Myers and Briggs brought Jung's typological theory to life and made available applications of type theory to individuals everywhere (Keirsey & Bates, 1978).

Criticisms. Critical remarks regarding the MBTI model have focused mainly on the reliability and factor structure of the instrument. For example, one-half of subjects were found to be classified as a different type when they took the MBTI five weeks apart (McCarley & Carskadon, 1983). Accordingly, Myers' types could not represent stable personality characteristics. Furthermore, item analysis of the MBTI revealed a six-factor structure, thus inconsistent with that developed by Myers (Sipps, Alexander, & Friedt, 1985). Recently, however, pointing to omissions and inappropriate techniques used by the researchers, the above claims have been rebutted (Hammer, 1996). Despite conflicting reports regarding its psychometric properties, the MBTI has enjoyed enormous success with counselors, educators, and employers since its publication in 1962. "Today the MBTI is the most widely used personality instrument in the world – two million administrations are given each year" (Myers, McCaulley, Quenk, & Hammer, 1998, p. 9).

Keirseian Theory

David Keirsey began a 50 year career in typewatching after a chance encounter in the mid-1950s with a psychologist familiar with the Myers-Briggs Type Indicator (Keirsey, 1998). Working with concepts developed by Jung and refined by Myers and Briggs, Keirsey eventually developed his own theory of temperament.

At least one major modification distinguishes Keirseian theory from his predecessors (Keirsey, 1998). Troubled by what he deemed subjective typologies of Jung and Myers that distinguish personality types almost exclusively by people's mental makeup, Keirsey developed a typology based on observable human behavior. Specifically, temperament types are derived from two basic human actions: how people communicate with others and how people use tools to accomplish their goals.

According to Keirsey, people are prone to use either abstract or concrete speech. Those who use abstract speech communicate in fictional, figurative, symbolic, and theoretical ways. Those who use concrete speech communicate in detailed, factual, literal, and specific ways. Thus, Keirsey delineates a dichotomous model captured by and reflected through word usage.

A dichotomy in the tools people use to accomplish goals also is postulated. People are predisposed either to cooperative or utilitarian tool usage. The cooperator, in his desire to get along with others, is inclined to use tools that have been approved by the social groups to which they belong. The utilitarian, stressing usefulness over social considerations, is inclined to choose tools that result in success with minimum effort and cost.

Keirsey postulated that the combination of one's preferences for word and tool use are present in the individual from birth and result in one of four possible temperament types: the Artisan (Myers's sensing-perceiving), Guardian (sensing-judging), Idealist (intuition-feeling), and Rational (intuition-thinking).

The Artisan, a concrete utilitarian, is artistic, audacious, and adaptable. Artisans are likely to be interested in the acquisition and perfection of technique. They also are likely to be impulsive, enjoy freedom, and have a strong play ethic.

The Guardian, a concrete cooperator, is dependable, beneficent, and respectable. Guardians are likely to enjoy accommodating others and belonging to groups. Moreover, Guardians often have a strong sense of morality.

The Idealist, an abstract cooperator, is characterized by empathy, benevolence, and authenticity. Idealists are prone to be concerned about the morale of those around them. They also are likely to champion the underdog and become involved in social causes.

Finally, the Rational, an abstract utilitarian, is characterized by ingenuity, autonomy, and self-confidence. Rationals are likely to be preoccupied with technology and the logic of building. They often put work before play and have a keen drive for accomplishment.

Not unlike the views of the other theorists presented in this paper, Keirsey considers the environment to be a powerful mediator in the expression of temperament. Accordingly, personality and character emerge through the interaction of one's temperament and environment (Keirsey, 1998).

Criticisms. Keirsey (1998) has operatized his theory of temperament with the creation of the Keirsey Temperament Sorter II. However, the author does not view the instrument as a "test". Thus, there are no statistics regarding its reliability or validity. Given the lack of its empirical support, the utility of the Keirsey Temperament Sorter II for research and practice is limited.

Stylistic Theory

Temperament has been discussed previously in light of its expression in adults. Given a consensus that temperament traits are early appearing substrates of personality, research with children is expected.

Thomas and Chess were at the forefront of this research. Unable to make sense of their clinical findings through standard applications of psychoanalysis, behaviorism, and learning theory (Chess & Thomas, 1996), these researchers turned toward biological explanations of individual differences. Thomas and Chess infer nine early appearing, constitutionally rooted temperament categories from their now famous New York Longitudinal Study (NYLS): activity level, rhythmicity, approach/withdrawal, adaptability, sensory threshold, quality of mood, intensity of mood expression, distractibility, and persistence/attention span (Thomas, Chess, Birch, Hertzig, & Korn, 1963). The dimensions are seen as the stylistic components of behavior that result from innate features within the brain (Goldsmith et al., 1987).

Using factor analysis, Thomas, Chess, and Birch (1968) found these dimensions are at least partially independent and cluster around three basic characteristics: easy temperament, slow-to-warm-up temperament, and difficult temperament. The easy temperament comprised about 40% of the NYLS sample and is characterized by a

positive approach to new stimuli, quick adaptability, and positive mood (Chess & Thomas, 1996). The slow-to-warm-up temperament comprised about 15% of the NYLS sample and is characterized by negative responses of mild intensity to new experiences and slow adaptability. With repeated exposure, these children gradually adapt to new experiences with "quiet and positive interest and involvement" (Chess & Thomas, 1996, p. 37). The final constellation, the difficult temperament, comprised about 10% of the sample and is characterized by withdrawal responses to new situations, irregularity in biological functions, slow adaptability, and frequent, intense negative reactions. This group represents a normal and healthy segment of the population despite these negative connotations (Chess & Thomas, 1996). About one-third of the NYLS sample was difficult to classify and did not fit into one of the three temperament categories, a result of varying combinations of traits (Chess & Thomas, 1996).

Central to Chess and Thomas' analysis is the notion that temperaments are not entirely fixed or immutable. Using the term *goodness of fit* (Thomas et al., 1968), they describe a view of temperament wherein environmental and maturational variables interact with the organism to play a pivotal role in the expression of temperament. According to Chess and Thomas (1996):

> Goodness of fit results when the organism's capacities, motivations, and style of behavior and the environmental demands and expectations are in accord. Such consonance between organism and environment potentiates optimal positive development. Should there be dissonance between the capacities and characteristics of the organism, on one hand, and the environmental opportunities and demands, on the other hand, there is poorness of fit, which leads to maladaptive functioning and distorted development. (pp. 52-53)

The goodness of fit model implies that caregivers who recognize and respect temperament traits can affect change in children's environments that promote the healthy development of individual personality (Chess & Thomas, 1996).

Criticisms. Major criticism of Thomas and Chess' approach centers on a weakness in the theory itself due to consistent failure to replicate their nine dimensional model of temperament (Slabach, Morrow, & Wachs, 1991). In addition to these empirical and theoretical issues, more than a few researchers level their criticism on the poorly structured parental interviews used to derive the NYLS dimensions (Bates, 1980; Buss & Plomin, 1984; Garrison & Earls, 1987; Goldsmith & Campos, 1982; McNeil, 1976; Persson-Blennow & McNeil, 1979; Rothbart & Derryberry, 1981). Like Slabach et al., Garrison and Earls (1987) pointed out that these methodological limitations challenge the essential theory underlying Thomas and Chess' approach. Despite these criticisms, Thomas and Chess' pioneering work, begun in the late 1950s, continues to evoke thoughtful consideration among current researchers and is widely regarded as the foundation for the modern study of temperament in young children (Bates, 1987; Plomin, 1986; Strelau, 1991; Wilson & Matheny, 1986).

Biological Theory

Eysenck, another of the more outspoken critics of psychoanalysis, employs stringent statistical methods to arrive at his biological explanation of human behavior. Partially influenced by Jung, Eysenck describes personality, which he equates with temperament, along three dimensions: extraversion-introversion (E), neuroticism (N), and psychoticism (P) (Eysenck, 1952). Eysenck's dimension of extraversion-introversion is comparable to Jung's description of these terms. Neuroticism is defined

as a general tendency to respond with excess emotion and anxious reactions under stress. Psychoticism refers to a condition characterized by a loss of contact with reality marked by episodes of delusions and hallucinations. At the opposite end of the neurotic and psychotic spectrums are normal personalities. Eysenck proposed that these dimensions have a complete biological basis, either through "physiological factors, neurological structure, biochemical and hormonal determinants, or other biological features of the organism" (Eysenck, 1991, p. 88).

A number of findings support Eysenck's claims that organic constituents primarily influence these dimensions. First, using the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975), Barrett and Eysenck (1984) demonstrated the universality of the dimensions in an extensive cross-cultural study involving more than 25 countries. The emergence of these dimensions across such a wide array of cultures provides compelling evidence for biological determinants of personality (Eysenck, 1991). Further evidence for biological influences is found in research that indicates a person's position along these dimensions remains relatively stable over long periods of time (Conley, 1984a, 1984b). Results of this nature are highly unlikely if everyday influences play a primary role in the formation of personality. Finally, using modern genetic methods, a number of studies indicate the likelihood that extraversion, neuroticism, and psychoticism are somewhat inherited (Eaves, Eysenck, & Martin, 1989).

Criticisms. Criticism of Eysenck's work has been leveled against his extraction of only three factors from the personality questionnaire data. For example, Cattell maintained that the demands of the data suggest that there are at least 16 dimensions of

personality. The enormous amount of work Eysenck has produced over the past 50 years has provided many opportunities for further scrutiny. The resulting dialog between Eysenck and his opponents clearly reflects the controversy associated with modern conceptualizations and has shown that alternative temperament perspectives are possible (Strelau, 1998).

Genetic Theory

The contributions of Eysenck as well as Thomas and Chess created a favorable context for Buss and Plomin's behavioral genetic approach to temperament (Strelau, 1998). In their view, temperaments are "inherited personality traits present in early childhood" (Buss & Plomin, 1984, p. 84). Based on their review of the literature, they inferred four broad traits that met their criteria: emotionality (E), activity (A), sociability (S), and impulsivity (I) (Buss & Plomin, 1975). A decade later they dropped the impulsivity trait on the grounds that its heritability was not firmly established (Buss & Plomin, 1984). Accordingly, emotionality is defined as the tendency to become upset easily and intensely. Activity refers to total energy output and is equated to physical movement. Sociability is defined as the tendency to prefer the presence of others to being alone. According to these researchers, EAS "traits are likely to be the foundation on which later personality traits are built" (Buss & Plomin, 1984, p. 84). Using behavioral genetics methods including twin, family, and adoption studies, Buss and Plomin (1975, 1984) provided considerable evidence for the heritability of the EAS traits.

Like Thomas and Chess, Buss and Plomin do not consider temperaments to be fixed identities. Pointing to the fact that heredity accounts for only a portion of the

variance in temperaments, they postulated that environments also must exert an important influence in temperament development (Buss & Plomin, 1984). EAS temperaments in the middle range of the dimensions are conceived to be most modifiable by the environment. Extreme temperaments tend to affect the environment. Thus, temperament and environment mutually influence one another.

Criticisms. Criticism of Buss and Plomin's theory center mainly on their claims regarding the heritability of the EAS traits. Independent researchers investigating the genetic contribution to the variance of these traits produced only moderate support for these conclusions (Goldsmith & Campos, 1982; Goldsmith & Gottesman, 1981; Matheny, 1980). Moreover, contending that some temperament dimensions may be genetically influenced but not heritable, Goldsmith (1986) questioned Buss and Plomin's view that heritability should be the defining criteria for temperaments. Criticisms aside, the methodology behind genetic analysis permits researchers a rare opportunity to systematically test the assumptions of EAS theory. The use of behavioral genetic techniques represents a promising field for the exploration of temperament and other behavioral phenomena.

Developmental Theory

Taking advantage of the growth in research on temperament, Rothbart and Derryberry used many of the findings as well as their own analyses to elaborate their developmental approach to the concept of temperament. They define temperament as constitutionally based, individual differences in reactivity and self-regulation (Rothbart & Derryberry, 1981). The term *constitutionally based* refers to relatively enduring biological aspects of the organism influenced over time by heredity, maturation, and

experience (Rothbart & Derryberry, 1981). The term *reactivity* is defined as arousability of the physiological and behavioral systems of the organism. The term *self-regulation* refers to processes that act to facilitate or inhibit reactivity including, among others, attention, approach, avoidance/withdrawal, and selection. With growth, the modulating affect of self-regulation on reactivity increases as these processes became more under effortful control. This unique perspective implies that genetic and developmental determinants lead to affective, motivational, and cognitive influences on temperament as well. Together these influences are integral in the later development of adult personality and temperament (Rothbart, 1991).

Criticisms. Rothbart and Derryberry's model has been criticized as too wide-ranging and difficult to operationalize and investigate (Buss & Plomin, 1984; Garrison & Earls, 1987; Goldsmith & Campos, 1982; Strelau, 1998). For example, Buss and Plomin (1984) and Goldsmith and Campos (1982) pointed out that most personality dispositions meet Rothbart and Derryberry's constitutionally based criteria for temperament. As many of these behaviors also involve reactivity and self-regulation, they concluded that the developmental approach does not adequately distinguish temperament traits from other behaviors. Despite these criticisms, this theory has continued to gain popularity with child-oriented temperament researchers (Strelau, 1998).

Emotion Centered Theory

Goldsmith and Campos' definitions of temperament are the most radically behavioral (Bates, 1987). Quite unlike the position of the contemporary theorists presented thus far, Goldsmith and Campos do not consider the biological aspects of

temperament as a definitional component of the construct. Instead, they center their research on behavioral aspects of the organism, based on the theoretical perspective that the "temperament phenomena of prime importance during infancy are those which have socially communicative functions" (Goldsmith & Campos 1982, p. 176). Additionally, noting that underlying temperaments may become masked by socialization influences and cognitive processes as children mature, Goldsmith and Campos further narrow their focus to the infancy period. With these criteria in mind, they describe temperament as "individual differences in the probability of experiencing and expressing the primary emotions" (Goldsmith et al., 1987). Primary emotions (e.g., fear, anger, joy, and excitement) are expressed behaviorally in the infant's facial, vocal, postural, and motor systems. Thus, temperaments are delineated by individual differences in the temporal and intensive parameters (i.e., latency, rise time, decay time, magnitude, shape) when expressing the emotions. Not unlike the views of other contemporary researchers presented in this section, with the exception of Eysenck, Goldsmith and Campos (1982) consider the environment to be a powerful contextual mediator in the expression of emotions.

Criticisms. Goldsmith and Campos' approach, like Rothbart and Derryberry's model, has resulted in comparatively few critical remarks (Strelau, 1998). Nevertheless, their theory has not gone entirely unchallenged. Buss and Plomin (1984) have found it difficult to operationalize the emotion oriented model. Pointing to the seemingly arbitrary inclusion of interest as a primary emotion, which they saw as more cognitive in nature, Buss and Plomin questioned what behaviors would not be examples of emotions. Strelau (in Matheny, 1986, p. 62) criticized their exclusive focus on

emotional behaviors as too narrow and their assessment techniques as incomplete and inconsistent (Strelau, 1998). Still, Goldsmith and Campos' focus on socially relevant behaviors (i.e., emotions) has added to the overall understanding of temperament and children's development (Bates, 1987).

Regulative Theory

Strelau (1983) developed his regulative theory of temperament based heavily on Pavlov's discussion of nervous system properties. Strelau (1985) defines temperaments as relatively stable personality traits revealed in energetic and temporal characteristics of behavior. Temperament traits are a product of inborn biological mechanisms and are subjected to slow changes caused by maturation and environmental factors. At the energetic level, behavior is described along the dimensions of reactivity and activity. Reactivity refers to differences in the intensity or magnitude of reaction to stimuli and is determined directly by physiological mechanisms of the organism. Activity refers to individual differences in the amount of stimulation needed to maintain or achieve the optimal level for activation. These two dimensions are conceived to be inter-related. That is, an individual's reactivity determines his or her optimal stimulation load. For example, a highly reactive individual regulates his or her acute sensitivity and intensity of reaction with a preference for activities of low stimulative value. Strelau (1998) devoted less attention to the temporal traits that he describes as individual differences in the speed, tempo, persistence, recurrence, regularity, and mobility of reactions.

Strelau essentially presents a relationship between temperament and personality where inborn traits determine the activity level that is aimed at regulating stimulation or organizing the environment. Over time, these physiologically determined preferences

of activity and environment result in patterns that affect the development of personality (Strelau, 1985).

Criticisms. A variety of models linking biological processes and temperament have been postulated (e.g., Strelau, Rothbart and Derryberry, Eysenck). Bates, Wachs, and Emde (1994) cautioned that, while biobehavioral systems may be relevant, such relationships remain tentative. Goldsmith and Campos (1986) found Strelau's concept hard to operationalize based on what they saw as a difficulty of separating energetic from nonenergetic behaviors. Garrison and Earls (1987) questioned the empirical validity of Strelau's adult oriented physiological approach, especially as it related to infants and children. Despite these criticisms, the eastern European orientation of Strelau's research has served to broaden the international scope of temperament analysis.

Student Styles Theory

Working under the premise that "goodness of fit" can be promoted in educational settings, Oakland postulated that children are best able to develop their talents and abilities when they and those around them have an understanding of type theory (Oakland et al., 1996). To that end, Oakland has delineated and operatized a theory of temperament in the Student Styles Questionnaire (SSQ; Oakland et al., 1996). Based on the tenets of Jung, Myers and Briggs, and Keirsey, the Student Styles Questionnaire is designed to detect differences along the dimensions of extroversion-introversion, practical-imaginative (Myers's sensing-intuitive), thinking-feeling, and organized-flexible (Myers's judging-perceiving).

The extroversion-introversion (EI) dimension identifies where one acquires energy. Children with an extroverted style receive energy from and are oriented to the outer world of people, things, and events. They typically seek interaction with others and are easy to get to know. Extroverted children also are likely to have many friends and a wide variety of interests. Conversely, children with an introverted style receive energy from and are oriented to their inner world of thoughts and ideas. Introverted children are likely to prefer solitude and private time. They also are likely to have a few close friends and a small number of interests that they pursue in depth.

The practical-imaginative (PM) dimension identifies whether one attends to facts or theories. The practical child is likely to pay attention to the real world and information that comes through one's senses. Children with a practical style typically take a realistic and pragmatic approach to life. They often pay attention to the present, value tradition, and work to maintain things that already exist. They often enjoy using and practicing skills already learned and may become discouraged when things get too complicated. Children with an imaginative style prefer to attend to the possibilities. They are likely to be creative and have many original ideas. They also are likely to prefer theory over facts. Children with an imaginative style are likely to be visionaries with a keen interest in improving the future.

The thinking-feeling (TF) dimension describes how one makes decisions. Children with a preference for a thinking style are likely to use objective standards to make decisions. They also are likely to be critical and have a talent for analyzing problems. Children with a thinking style typically value logic over sentiment. Conversely, children with a feeling style typically use personal and subjective standards

to make decisions. They are likely to be sympathetic and have a talent for understanding relationships. Children with a feeling style are comfortable with emotional issues and typically value sentiment over logic.

The organized-flexible (OL) dimension indicates when one likes to make decisions. Children with an organized style are likely to settle things and seek closure in their affairs. They like to have a plan and often schedule their activities. They typically are persistent and dependable. Children with a flexible style are likely to put off decision-making and often are comfortable leaving matters undecided. They adapt to life as it comes. They also are likely to be flexible in their attitudes and commitments. See Appendix A for a more comprehensive review of characteristics associated with each of the four dimensions measured by the SSQ.

Once again, a theory has been postulated that emphasizes the role of the environment in the expression of temperament. Indeed, a basic assumption of student styles theory asserts that parents and teachers can nurture children's growth by creating environments that are consonant with their temperament styles.

The applied nature of student styles theory makes it appealing both to students and teachers. For example, students may enhance personal development by identifying talents and possible weaknesses. Social development may be enhanced through self-understanding and understanding of others. Moreover, student styles theory provides teachers important information regarding students' learning styles and their optimal learning environments. Teachers also may acquire a better understanding of their students' communication patterns, and academic and personal problems in light of the information provided by student styles theory.

Criticisms. To date, the SSQ has not been subject to critical review by outside investigators; thus critical commentary does not exist in the literature. However, during the course of the current investigation, this researcher identified an error in the scoring protocol for item 10 of the SSQ. Still, extensive factor-analytic research indicates the SSQ's internal structure is consistent with its theoretical framework and supports use of the instrument for measuring temperament styles displayed by U.S. children and adolescents.

Developmental Perspectives

As earlier referenced in this paper, most contemporary researchers agree that temperament dimensions are biologically rooted determinants of adult personality and therefore show stability and continuity over time. From a seemingly contradictory perspective, these researchers also agree that such dimensions are influenced by contextual factors. Such a view implies that temperament traits can be modified by the cognitive, social, and emotional qualities experienced throughout childhood and later. In other words, temperament develops and evolves. The purpose of this section is to provide an overview of temperament development and to describe the functional significance of individual differences in temperament dimensions.

Rothbart's (1989) extensive review of the literature reported the developmental sequence of temperament dimensions from the newborn period through childhood. According to Rothbart, the newborn period is marked by the emergence of individual differences in negative emotionality (i.e., reactivity), activity level, distractibility, attention span (i.e., task persistence), and approach-withdrawal. Early infancy is associated with all components of newborn temperament and the emergence of

individual differences in positive emotionality (i.e., reactivity). The period of late infancy is associated with all components observed in earlier periods as well as the emergence of inhibition of approach, sociability (i.e., introversion-extraversion), and self-regulation (i.e., effortful control). During the preschool to late adolescent years, temperaments are refined through experience and practice and resulted in the adult personality.

The preceding topical review provides insight into the emergence of temperament dimensions. However, it is incomplete without a discussion of the fundamental significance of individual differences along temperament dimensions and later development.

Activity and development. "Activity level is a dimension of individual difference that appears as a primary component of most scales of infant and child temperament . . . in large measure because it is a highly salient feature of child behavior" (Eaton & Enns, 1986, p. 19). As a cornerstone dimension of temperament, several studies in temperament research have focused exclusively on activity level and developmental implications (Buss, 1981; Buss, Block, & Block, 1980; Eaton, 1994; Eaton & Enns, 1986; Halverson & Waldrop, 1976). For example, Buss et al. (1980) found that activity level at ages three and four is associated with motor and behavioral activity at age seven. More specifically, in the motor domain, highly active preschool children, in contrast to their same age peers, are more physically active, energetic, and fidgety at age seven. Highly active preschoolers also are less likely to be inhibited and physically cautious in adolescence. Interpersonally, at age seven, they are more likely to stretch limits, take advantage of others, try to be the center of attention, compete with

others, assert themselves, and display physical and verbal aggression. They also are less likely to be obedient or shy than their same age peers. Finally, at age seven, highly active preschoolers are less likely to keep thoughts and feelings to themselves, delay gratification, and think ahead. These results are consistent with findings that show preschool activity is positively correlated with dominance in interpersonal relationships and independence at age seven (Halverson & Waldrop, 1976).

A relationship between activity and intellectual ability also has been reported (Halverson & Waldrop, 1976). Specifically, high activity during the preschool period is negatively correlated with scores on both verbal and performance scales of the Wechsler Intelligence Scale for Children at age seven. In a similar study, a relationship between activity and intelligence was not confirmed (Czeschik, 1993). However, significant overlap between high intelligence and temperament dimensions of low distractibility and high persistence were reported. Academic achievement and scholastic ability are negatively correlated with activity and distractibility and positively correlated with persistence (Martin, 1989).

Relationships between children's' activity level and parental behaviors also have been examined (Buss, 1981). Parents with preschoolers who display low activity levels are more resourceful, responsive, and successful in aiding their children than parents of preschoolers who display high activity levels. The parents low active preschoolers also are described as more patient, supportive, and encouraging. Conversely, parents of highly active preschoolers have a greater tendency to get in power struggles, intrude physically into tasks, and have more difficulty establishing good working relationships with their children. Impatience, frustration, and hostility also often mark parent

interactions with highly active children. While problematic activity levels tend to decrease between ages four and eight (Achenbach, 1978), some relationships inevitably result in poorness of fit, derived from the discrepancies in the characteristics of the child and environment. Temperament risk factors predisposing a child to a poor fit increase the probability of behavior disorders and maladapted personality (Carey, 1989; Thomas et al., 1968).

Inhibition and development. The temperament roots of shyness (i.e., social inhibition) and its developmental implications have been explored (Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998). Internalized negative emotions at ages 4 through 6 are predictive of shyness at ages 6 through 8 and again at ages 8 through 10. Also, shy children's' proneness toward internalizing negative emotion predicts low instrumental coping (e.g., reluctance to seek support from teachers). These results are consistent with earlier findings that show most children classified as extremely shy and emotionally subdued (e.g., inhibited) at age 2 retain their classification through age 8 (Kagan, 1989; 1994b). Kagan (1994b) also suggested that about one-third of inhibited children are at risk for social phobia and anxiety in adolescence and extreme introversion in adulthood. Interestingly, extremely shy children report fears, such as speaking in class and attending summer camp (Kagan, 1989). Such fears might developmentally precede the characteristics of adult shyness (i.e., anxiety, social fear, loneliness, suspicion, and resentment) described by Eisenberg, Fabes, and Murphy (1995).

NYLS dimension of temperament and development. The developmental change and stability of the NYLS dimensions from infancy to adolescence have been reported (Guerin & Gottfried, 1994). Developmental change during this period is dimension and

time specific. That is, more change occurs during the period prior to the entry of kindergarten (i.e., age three through five) than during the period after entry (i.e., age eight through twelve). More specifically, in contrast with three-year-olds, five-year-olds are more rhythmic, adaptable, positive in mood, and persistent. A developmental direction toward milder intensity of reaction and lower activity level also is found at age five. Mean changes in middle childhood, though fewer in number, also are found. Older children show a developmental direction toward less activity, intensity, and reactivity and greater approachability. Interestingly, despite these developmental changes, cross-sectional (i.e., time) stability was found along all nine dimensions as assessed by the relative rank of children across time (Guerin & Gottfried, 1994).

Easy/Difficult temperament and development. Temperament researchers also have focused on the developmental implications of children identified with easy or difficult temperaments. Two related studies (Korn, 1984; Chess & Thomas, 1984) reported that easy or difficult temperament at age three is associated with easy or difficult temperament in young adulthood (i.e., age 18-22). That is, easy children tend to remain easy in early adult life while difficult children tend to remain difficult. Chess and Thomas' study also showed that infants with difficult temperament have greater potential for an improper fit than do infants with other temperament characteristics. Accordingly, difficult temperaments at age three predispose inadequate adjustment, including behavioral and psychiatric disorders, in early adulthood (Chess & Thomas, 1984).

Similarly, the difficult temperament cluster is a predisposing factor for an unsuitable fit in school settings (Keogh, 1989). Students described by their teachers as

low in persistence and adaptability, high in distractibility and activity, and high in reactivity also are less likely to be described as teachable. Moreover, these students reportedly have significantly less positive social interactions with their teachers (Keogh, 1994).

A transcultural replication of the above findings regarding the predictive power of easy or difficult temperaments also has been reported (Maziade, Cote, Boudreault, Thivierge, & Boutin, 1986). The most temperamentally easy and difficult 7 year-olds from a large Quebec sample were targeted. At age 12, temperaments were reassessed. Results were consistent with earlier findings that showed continuity of easy and difficult styles. However, results also showed "parental behavior control may be a protective factor against the risk associated with difficult temperament" (Maziade et al., 1985, p. 945). That is, superior functioning families characterize their difficult children as less difficult at age 12, whereas dysfunctional families are at increased risk for temperamentally difficult children with possible psychiatric disorders at age 12.

A related study explored relationships between extreme difficult temperament and psychiatric disorder in children between ages 3 and 12 referred for psychiatric service (Maziade, Caron, Cote, Boutin, & Thivierge, 1990). Results showed an over-proportion of extremely difficult temperaments in the referred population. Clinical problems among these children centered on externalized disorders (i.e., opposition, conduct or attention-deficit) and specific developmental delays.

Origins of behavior problems and competencies. The temperament origins of adolescent behavior problems and competencies were explored in an extensive longitudinal study (Caspi, Henry, McGee, Moffitt, & Silva, 1995). Lack of control (i.e.,

difficult), sluggishness (i.e., slow-to-warm-up), and approach dimensions were measured at ages 3, 5, 7, and 9 and compared with reports of behavior problems at ages 9, 11, 13, and 15. Findings showed that children characterized by a lack of control in early childhood are more likely to exhibit antisocial behavior, conduct disorder, hyperactivity, and attention problems in adolescence. Early childhood sluggishness in girls also is associated with later attention problems. Finally, children characterized as high on approach later are described by their parents as having more personal strengths than those characterized by a lack of control and sluggishness in early childhood. The researchers postulated that a possible explanation for these behavioral connections was that extreme temperament characteristics in early childhood are early manifestations of adolescent behavior problems. Person-environment interaction patterns that tend to reinforce behaviors across the course of life also were identified as a possible link between temperament and later behavior.

A related study (Caspi & Silva, 1995) explored the predictive relationship of temperament qualities in early childhood and personality traits in young adulthood. Results demonstrated that behavioral styles at age 3 are associated with distinct personality differences at age 18. More specifically, preschoolers identified as undercontrolled describe themselves as danger seeking and impulsive at 18. Inhibited preschoolers later describe themselves as nonassertive, cautious, and submissive. Both reserved and inhibited preschoolers score low on social potency in early adult self-reports. Confident children describe themselves as impulsive at age 18. Finally, children identified as well adjusted at age 3 describe themselves as average young adults at age

18. The preservation of behavioral styles across time was tentatively attributed to genetic factors and the previously mentioned person-environment interaction patterns.

Temperament and the Big Five structure of personality. A chapter by Martin, Wisenbaker, and Huttunen (1994) provides highly speculative links between NYLS based temperaments in childhood and the Big Five structure of adult personality. The Big Five are considered to provide a comprehensive taxonomy of personality characteristics and have been labeled as follows: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae, Costa, & Yik, 1996). Extraversion refers to individual differences in preferences for social interaction and lively activity. Agreeableness refers to individual differences in the degree to which one displays selfless concern for others. Conscientiousness refers to individual differences in organization and achievement. Neuroticism refers to individual differences in proneness for experiencing unpleasant and disturbing emotions and thoughts. Openness refers to individual differences in receptiveness to new ideas and experiences (McCrae & Costa, 1990).

Assuming that temperament characteristics may be understood as early-appearing personality traits, Martin et al. (1994) postulated that childhood activity is a strong predictor of extraversion in adulthood. Pointing out that the extraversion cluster of the Big Five structure of adult personality includes the components of activity, energy, and vigor, Eaton (1994) also concluded that childhood activity predicts extraversion in adulthood.

Social inhibition in childhood is speculatively related to both the extraversion and neuroticism factors of the Big Five. The adult neuroticism factor also is thought to

be associated with the childhood temperament dimensions of adaptability and negative emotionality. Emotionality in childhood also is conjectured to predict agreeableness in adult personality. Finally, childhood task persistence is hypothesized to predict adulthood conscientiousness. While these conjectures have little theoretical and empirical foundation, Strelau (1998) noted that relationships between the Big Five and temperament will become one of the more thoroughly investigated areas of personality research in coming years.

Student Styles dimensions of temperament and development. A study of students age 8 through 17 identified several developmental trends in the expression of temperament (Thayer, 1996). First, extroversion increases with age. That is, students age 12 through 17 display a stronger preference for extroversion than do students age 8 through 11. Interestingly, students age 12 through 15 display the greatest preference for extroversion; preferences for extroversion level off and decrease after age 15.

Older students (i.e., age 16 and 17) also exhibit a higher preference for feeling than do younger students. Additionally, students age 14 through 17 exhibit a higher preference for flexible styles than do students age 8 through 11. Finally, students age 10 through 13 exhibit a higher preference for imaginative styles than do 8-year-old students.

MBTI and type development. The theory driving the MBTI is explicit with regard to type development. "Type theory assumes that type does not change over the life span" (Myers et al., 1998, p. 28). According to Myers and Myers (1980), children are born with type predispositions and are motivated to exercise these preferences. As children became more skillful and adept in their use of preferred functions, opposite

functions are relatively neglected. In adolescence and adulthood, individuals continue to exercise and refine their use of the preferred functions. Finally, during midlife, individuals are motivated to complete their personality by "gradually adding the previously neglected tertiary and inferior functions to the sphere of operation. . . . however, this did not include a change in a person's type" (Myers et al., 1998, p. 28).

Gender Perspectives

While gender is recognized as an important influence on child and adolescent development and socialization (Macoby & Jacklin, 1974), males and females generally are more similar than different with respect to childhood and adolescent temperament. Nevertheless, gender differences in temperament dimensions exist albeit are somewhat rare and often are restricted to differences in activity level (Kohnstamm, 1989; Persson-Blennow & McNeil, 1981; Rutter, 1982; Prior, Smart, Sanson, & Oberklaid, 1993). As Chess and Thomas (1984) stated, "the findings from the NYLS and from other centers abroad are consistent in the absence of striking sex differences in temperament" (p. 94). Gender differences in temperament are discussed below. The focus is on relevant to the current investigation.

NYLS dimensions of temperament and gender. Macoby and Jacklin's (1974) research regarding human activity level is a useful starting point. Their research showed that boys are more active than girls after the first year of life. Activity is one of the few dimensions along which gender differences have been documented consistently. Maziade, Boutin, Cote, and Thivierge's (1986) extensive review of gender differences in research utilizing the NYLS model of temperament found boys, ranging from ages 1 to 12, are more active in seven of eight studies (including three of their own). These

results are consistent with another major review (Eaton & Enns, 1986) of 127 studies reporting on activity and activity-like dimensions (e.g. vigor in play, energy level, restlessness). Studies included in the review consistently showed that males display higher activity levels and activity-like dimensions. "Expressed in yet another way, the average male subject (at the 50th percentile) is more active than 69% of the female subjects" (Eaton & Enns, 1986, p. 22).

Few studies have found gender differences along other NYLS dimensions. Differences, when found, were moderately congruent with other findings. For example, males age 8 through 12 are reported to exhibit higher sensory threshold together with less adaptability, predictability, and persistence than females (Hegvik, McDevitt, & Carey, 1982). Another study found males at age 7 to be more negative in mood and higher in sensory threshold than females (Maziade, Cote, Boudreault, Thivierge, & Caperaa, 1984). Related studies found males ages 9 through 12 to be less predictable and persistent and higher in sensory threshold than females (Maziade et al., 1985; Maziade et al., 1986). Moreover, males at age 7 are more likely to be more difficult than females (Maziade, Cote et al., 1984). These results contradict Korn's (1984) finding that the number of males and females in the extreme quartiles for easy or difficult temperament at ages 1 through 5 and during the teen and young adulthood periods are approximately equal. Korn also reported that, during the teenage period, females with easy temperament and males with difficult temperament are predictable based on their temperament profiles from earlier ages.

Gender differences on adaptability were reported in a ten-year longitudinal study of children ages 2 through 12 (Guerin & Gottfried, 1994). The findings are inconsistent

with others reported in NYLS-based research such as those described above and led Guerin and Gottfried to conclude "that gender differences do not characterize the construct of temperament with respect to the issues of developmental change and stability during childhood" (p. 351).

CBQ dimensions of temperament and gender. Reports of gender differences in temperament studies not employing questionnaires based on the NYLS model are even more rare yet exist. Gender differences among 6 and 7 year-olds on the surgency and effortful control scales of the Child Behavior Questionnaire (CBQ; Rothbart, 1988), designed to measure Rothbart and Derryberry's construct of temperament, have been reported (Ahadi, Rothbart, & Ye, 1993). On the surgency scale, boys are higher on activity. On the effortful control scale, boys are lower on inhibitory control, low intensity pleasure, and perceptual sensitivity. Similar findings were reported by Eisenberg et al. (1998) in their investigation of the relationship between children's shyness and regulation. Their CBQ results show boys at ages 7, 9, and 11 are viewed as lower in behavioral regulation (i.e., self-control and inhibition control). Findings also show boys at ages 7 and 11 are lower on attention shifting and attention focusing. Although low attention shifting and focusing have been associated with adults' reports of shyness (Eisenberg et al., 1995), no significant gender differences for shyness were found at ages 7, 9, and 11.

Adolescent behavior problems and gender. In their exploration of the temperament origins of child and adolescent behavior problems, Caspi et al. (1995) found that boys high on approach in early childhood are less likely to experience

distress and anxiety in later years. Girls high on sluggishness in early childhood are more likely to suffer from distress, anxiety, and attention problems in later years.

Student Styles dimensions of temperament and gender. Gender differences have been reported on dimensions of temperament measured by the Student Styles Questionnaire (Oakland et al., 1996). The greatest differences were found on the thinking/feeling dimension. More specifically, 72% of females prefer a feeling to a thinking style. On the other hand, 64% of males prefer a thinking to a feeling style. Smaller gender differences were found on the organized/flexible dimension. Fifty-nine percent of females, compared with 42% of males, prefer an organized style. Fewer gender differences appeared on the extroverted/introverted and practical/imaginative dimensions. Sixty-four percent of females and 66% of males prefer the extroverted style. Similarly, 64% of females and 67% of males prefer the practical style.

A study of students ages 8 through 17 examined relationships between gender and temperament dimensions as measured by the SSQ (Thayer, 1996). These results are consistent with earlier observations. More specifically, in contrast to female students, male students exhibit a higher preference for practical, thinking, and flexible styles. Male and female students do not differ in their preferences for extroversion and introversion.

MBTI research and gender. The best current estimates of adult MBTI type distributions in the U.S. (Hammer & Mitchell, 1996) found gender differences on all dimensions. The most striking is on thinking/feeling. More specifically, 69% of males prefer thinking to feeling. On the other hand, 61% of women prefer feeling to thinking. Other gender differences were less sizable. Fifty-four percent of males and 53% of

females report a preference for extroversion. Sixty-four percent of males and 71% of females report a preference for a practical style. Fifty-five percent of males and 61% of females report a preference for an organized style. Despite inconsistencies with previous estimates, Hammer and Mitchell suggest these norms provide a current and close approximation to a nationally representative sample and recommend their use whenever type data are needed.

Purposes of the Study

A large portion of the extant temperament research has focused on temperament variation among infants and young children. Indeed, research with older children and adolescence is virtually nonexistent. The primary purpose of this investigation is to examine and describe possible changes and continuity in the prevalence rates of temperament preferences displayed by U.S. male and female students ages 8 through 17.

The Student Styles Questionnaire provides a synergy of dimensional and categorical approaches to temperament measurement (Oakland, Glutting & Horton, 1996). It can yield categorical data in that one can sort individuals into one or another classification group (e.g., extrovert or introvert). It can yield dimensional data in that one can utilize the data to estimate the strength of a temperament trait an individual possesses relative to others.

While norming the SSQ, careful consideration was taken to accurately record the percentage of each of the temperament traits occurring in the general population. Population prevalence rates were estimated based on an extensive review of related research and instruments measuring related constructs such as the MBTI (Oakland et

al., 1996). This review showed that the base rate for an extroverted style is approximately 65% and 35% for an introverted style. Similarly, the base rate for a practical style is about 65% and 35% for an imaginative style. The base rates for thinking-feeling and organized-flexible styles are approximately 50%. Support for these base rates were found in the preliminary analyses of the SSQ data. Based on this information, the authors of the SSQ developed a nontraditional, prevalence-based *T*-score system in which score of *T*50 was set in such a manner that the percentage of children scoring above score of *T*50 on each scale would match each dimension's assumed prevalence rate in the general population (Oakland et al., 1996). For example, 65% of children in the standardization sample score above a score of *T*50 in the prevalence-based *T*-score system and therefore are classified as extroverted. Thirty-five percent of children in the sample score below a score of *T*50 and are classified as introverted.

The use of a nontraditional prevalence-based *T*-score system is not without precedent. The Millon Index of Personality Styles (MIPS; Millon, Weiss, Millon, & Davis, 1994), an instrument designed to measure personal styles of normally functioning adults, also uses such a scaling procedure.

While the decision to use a prevalence-based *T*-score system is empirically supported, the use of population prevalence rates obtained from research with adults (e.g., MBTI, MIPS) may be insufficient for describing prevalence rates among children. It is plausible that the prevalence of temperament traits in children are different than prevalence rates found among adults.

Therefore, the current investigation is descriptive in nature and attempts to delineate accurately the temperament prevalence rates among children by circumventing prevalence-based *T* scores generated by the SSQ. The procedures used in this process are discussed in the methods section.

Research Questions

This study addresses the following questions:

Question 1: What are the prevalence of extroversion-introversion styles and do they change as a function of age and gender?

Question 2: What are the prevalence of practical-imaginative styles and do they change as a function of age and gender?

Question 3: What are the prevalence of thinking-feeling styles and do they change as a function of age and gender?

Question 4: What are the prevalence of organized-flexible styles and do they change as a function of age and gender?

CHAPTER 3
METHODS

Participants

Self-reports of temperament preferences displayed by U.S. male and female students ages 8 through 17 were utilized. Data were obtained during the norming of the Student Styles Questionnaire (SSQ). The standardization sample was designed to reflect 1990 U.S. Bureau of the Census data (Oakland et al., 1996) and was stratified along five categories: age, gender, race/ethnicity, geographic region, and school type. The participant pool of 7,902 students included a total of 10 age groups ranging from 8 through 17 years (sample sizes of 531, 648, 932, 1,174, 1,119, 1,162, 921, 639, 409, and 367 at ages 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, respectively) and was representative of both male and female genders (sample sizes of 3,950 and 3,952 respectively). Four racial/ethnic groups were represented, including 5,547 Whites, 1,194 African Americans, and 868 Hispanics. The fourth group, labeled "Other", included 293 students whose racial identity was unknown. The subjects were drawn from four geographic regions including the Northeast, North Central, South, and West. The sample included students from public and private schools in 61 school districts from 29 U.S. states and Puerto Rico.

Instrumentation

The SSQ is a 69 item temperament scale patterned after the Jungian constructs popularized by Myers-Briggs Type Indicator. The SSQ may be administered to individuals or groups.

The SSQ was administered to 7,902 students between ages of 8 through 17 (see Appendix B for detailed administration directions). The paper and pencil test requires approximately 20 to 30 minutes to complete. Each of its 69 forced-choice items has two alternatives that fall at either extreme of one of the four primary dimensions (i.e., scales): extroversion (E) - introversion (I), practical (P) - imaginative (M), thinking (T) - feeling (F), and organized (O) - flexible (L). Among the 69 items, 23 are included on the EI scale, 16 on the PM scale, 10 on the TF scale, and 26 on the OL scale. Additionally, 6 items provide information simultaneously for two scales.

Interpretation

Three methods can be used to interpret information yielded by the SSQ. The first method focuses on each of the eight basic and dichotomous styles, the second focuses on combinations of two styles, and the third focuses on combinations of four styles. For purposes of the present investigation, interpretations based on the eight basic styles are utilized and have been previously described.

Reliability

The reliability of a measure refers to the degree to which its scores are free from errors of measurement. Most theories of personality suggest that personality traits are somewhat stable throughout development. Therefore, reliability estimates that examine stability are most suitable for measures of temperament and personality (Kamphaus &

Frick, 1996). Thus, test-retest methods commonly are used for evaluating an instrument's stability.

Test-retest reliability of the SSQ was examined by administering the SSQ to a sub-sample of the 7, 902 students included in the standardization phase. One-hundred thirty-seven ethnically diverse male and female students ranging from ages 8 through 17 completed the SSQ twice. The interval between the two SSQ completions was 7 months. Reliability coefficients for the EI, PM, TF, and OL dimensions are .80, .67, .70, and .78 respectively. An average reliability coefficient of .74 is obtained when Fisher's z transformation is applied. Results of these analyses suggest SSQ scores are satisfactorily reliable. The reliability coefficients may be quite satisfactory given the long period between the two administrations of the SSQ.

Validity

Validity refers to the degree to which a test measures what it purports to measure. Validity constitutes the single most important psychometric characteristic of a test (Messick, 1989). Careful consideration was taken to establish both the internal and external validity of the SSQ throughout its development and standardization.

Internal validity. A series of factor analyses were used to establish the internal validity of the SSQ. Initial factor analyses assessed the degree to which a pool of 245 original items loaded on the four basic scales hypothesized for the SSQ. Results of this analysis yielded 100 items that loaded appreciably on one or more of the four factors. These items were subsequently subjected to a second series of factor analyses during the standardization phase of the SSQ. First, dichotomous item scores were forced into the hypothesized four-factor solution using squared multiple correlations as the

communality estimate. The solution was evaluated using two criteria; each item show an appreciable loading of ≥ .20 on its hypothesized factor and ≤ .10 of the items load on more than one factor. Results of item factoring yielded 69 items that satisfied both criteria and guided the formation of four to five item parcels used in the second analysis. Items with similar factor loadings were grouped into 17 parcels and correlations among item parcels were submitted to factoring. Each parcel showed an appreciable loading on its hypothesized factor (i.e., ≥ .40) and ≤ 10% of the parcels loaded on more than one factor. Finally, the factoring of the parcels was repeated 17 times, leaving one of the parcels opened during each factoring. Such analysis allowed for direct examination of whether the individual items in each open parcel loaded on their hypothesized factor. Results of all factor analyses met the internal validity requirements specified by the substantive-construct model of instrument development (Cronbach & Meehl, 1955).

Construct validity. Two studies examining the construct validity of the SSQ for comparisons of racial-ethnic groups have been conducted since publication of the SSQ. The first study (Stafford & Oakland, 1996b) used confirmatory factor analyses to determine whether the 17 item parcels created during standardization of the SSQ are statistically similar for African American, Hispanic American, and Anglo American samples. Coefficients of congruence calculated for the three comparisons showed a high degree of congruence (i.e., .90 to .99).

The second study (Stafford & Oakland, 1996a), similar in nature, examined the construct validity of the SSQ for the comparison of African American, Hispanic American, and Anglo American when age is considered a factor. Specifically, the study

used factor analyses to examine the factor structure of the SSQ across the three racial-ethnic groups for children ages 8 though 10, 11 through 13, and 14 through 17. Coefficients of congruence for the three comparisons were between .75 and .94, .87 and .99, and .82 and .98 for the 8 to 10, 11 to 13, and 14 to 17 age groups respectively. Results of these studies suggest the constructs of temperament appear to be similar across racial-ethnic groups and the use of the SSQ with these groups is supported.

External validity. External validity of the SSQ was established using contrasted groups, convergent validity, and divergent validity approaches. The contrasted groups approach involved analysis of groups selected from the SSQ standardization sample based on their vocational preferences, class preferences, leisure activity preferences, special program involvement, and self-evaluation. Each groups' scores on the SSQ's four scales were contrasted with scores for all other students in the sample. Students with different interests in vocations, personal beliefs, and other personal qualities were expected to perform differently on one or more of the SSQ scales. Analysis of variance and Tukey post hoc comparison results (significance of $p < .01$ and $p < .05$ respectively) showed that styles indicated by the SSQ were related to personal preferences indicated by students and generally confirm the theoretical foundation of the instrument.

Convergent validity of an instrument is established when the measure correlates highly with constructs with which it is hypothesized to have a strong relationship. Two studies were undertaken to assess the convergent validity of the SSQ. The first study evaluated the relationship between the SSQ and the Values Inventory (VI; Oakland, 1990). The VI is a close-ended 10 item self-report instrument designed to measure the importance of values such as helpfulness and loyalty in children's daily lives. A sample

of 134 ethnically diverse male and female students ranging in age from 8 to 17 years was utilized for this study. Results of univariate comparisons indicate significant correlations exist between SSQ dimensions and relevant VI counterparts. For example, significant positive relationships were found between the helpfulness dimension of the VI and SSQ dimensions of practical-imaginative ($r = .28$, $p < .001$) and organized-flexible ($r = .39$, $p < .001$). This suggests that students who prefer a practical style are more likely to value being helpful than those with an imaginative style. Similarly, students who prefer an organized style to a flexible style also are more likely to value being helpful. Additionally, significant negative relationships were found between the SSQ dimension of thinking-feeling and the helpfulness ($r = -.25$, $p < .01$) and loyalty ($r = -.35$, $p < .001$) dimensions of the VI. That is, students who prefer a feeling style to a thinking style are more likely to value being helpful and loyal. Moreover, results of multivariate comparisons between the SSQ and VI yielded significant correlations (multiple R: helpfulness = .54, $p < .001$; multiple R: loyalty = .38, $p < .001$). The appreciable correlations found in both the univariate and multivariate analyses indicate that there is substantial convergent validity between children's values and temperament qualities indicated by the SSQ.

A second study of convergent validity evaluated relationships between the SSQ and the Myers-Briggs Type Indicator. The sample was composed of 99 White and African American male and female students. This study was confined to older students who were eligible to take both SSQ and MBTI, therefore students ranged in age from 12 through 17 years. Since these instruments purport to measure similar qualities, high correlations between the SSQ scales and similar MBTI dimensions were expected.

Results of univariate comparisons showed appropriate convergent validity across all four scales. More specifically, the SSQ extroverted-introverted, practical-imaginative, thinking-feeling, and organized-flexible scales correlated appreciably with their MBTI counterparts of extraversion ($r = .62$, $p < .001$) and introversion ($r = -.65$, $p < .001$), sensing ($r = .40$, $p < .001$) and intuiting ($r = -.29$, $p < .01$), thinking ($r = .36$, $p < .001$) and feeling ($r = -.25$, $p < .05$), and judging ($r = .22$, $p < .05$) and perceiving ($r = .26$, $p < .01$). Additionally, canonical correlation analysis was conducted to better reveal the nature of multivariate correlations between the SSQ and MBTI. Canonical analysis showed a statistically significant set of relationships between the instruments (Wilks' Lambda = 2.99; approximate $F[4, 91] = 4.53$; $p < .001$). Three out of four canonical variates yielded relatively strong canonical correlations (i.e., .48, .23, and .20) and were retained. The averaged square canonical correlation was used to assess the degree of multivariate overlap between the SSQ and MBTI. Scores from the SSQ captured 30% of the total variability in the MBTI and suggest that SSQ measures the same general temperament types indicated by the MBTI. Results of the univariate and multivariate analyses support the convergent validity of the SSQ and indicate that both instruments assess important temperament characteristics.

Divergent validity of an instrument is established when the measure correlates poorly with constructs with which it is hypothesized to be unrelated. Four studies were undertaken by the authors to assess the divergent validity of the SSQ (Oakland, Glutting, & Horton, 1996). These studies evaluated the degree to which students' scores on the SSQ were influenced by their academic achievement as measured by the California Achievement Test (CAT; CTB/McGraw-Hill, 1985) and Metropolitan

Achievement Test, Sixth Edition (MAT6; Prescott, Barlow, Hogan, & Farr, 1985). The first study examined relationships between the SSQ and the CAT and included a sample of 208 ethnically diverse male and female students ages 8 through 15. Univariate correlations between the four SSQ scales and the CAT Total Reading, Total Mathematics, Total Language, and Overall Battery scales were calculated with significance for the correlations set at $p < .05$. Of the 16 correlations, 14 yielded non-significant values. The highest univariate correlation was found between the organized-flexible and Total Mathematics scales and was quite low ($r = -.16$). Multiple regression analyses were conducted to obtain multivariate correlations between the instruments. The highest multivariate correlation was obtained between the SSQ and the Total Mathematics scale ($r = .18$) and also was low.

A second study replicated the first CAT study with an independent sample of 687 ethnically diverse, male and female students ages 7 through 17. Results of univariate and multivariate analyses yielded correlations that were generally lower than those reported in the first study. Similarly, results of a third study showed univariate and multivariate analyses between the SSQ and MAT6 also were quite low.

A fourth study was undertaken to establish divergent validity between the SSQ and children's intellectual ability as measured by the Wechsler Intelligence Scale for Children – Revised (WISC-R; Wechsler, 1974). The sample was composed of 86 ethnically diverse male and female students ages 8 through 17. Univariate correlations between the four SSQ scales and the WISC–R Full Scale IQ, Verbal Scale IQ, and Performance Scale IQ were calculated. All 12 correlations were non-significant ($p \geq .05$). Similarly, none of the multivariate correlations between the instruments were

significant. Findings of this nature indicate substantial divergent validity for the SSQ and demonstrate that students' academic achievement and intellectual ability are unlikely to affect performance on the SSQ and interpretations derived from SSQ scores.

Data Analyses Procedures

Prior to statistical analyses, the percentage of children expressing a preference on the eight basic SSQ styles was calculated. These values were obtained first by analyzing individual responses to the 69 SSQ items. For example, among the 16 items that assess the practical-imaginative style, students who select a larger number of practical options were labeled practical. Conversely, students selecting a larger number of imaginative options on such items were labeled imaginative. Students with no preference (i.e., those that select 8 practical options and 8 imaginative options) were not included in subsequent analyses on that scale. Finally, for each sample, the number of students displaying a particular preference on each scale was divided by the total number of students displaying any preference on the scale. To illustrate, let us assume 560 of 648 U.S. 9-year-olds sampled display a preference on the EI scale. Among these, 302 students age display a preference for introversion. Thus, 53.9 % of 9-year-olds would be labeled introverted and 46.1 % would be labeled extroverted. Percentages of style preferences displayed by students at ages 8 through 17 are presented in Table 1 in the results section.

A series of data analyses was used to describe the data. One study using logistic regression procedures, a form of multiple regression that can be used with dichotomous dependent variables, was undertaken. The study was designed to detect age, gender, and age-by-gender interaction effects. Thus, this series of analyses used two independent

variables (i.e., age and gender) to describe developmental trends. Conceptually, this can be thought of as a model that considers two regression equations, one for each gender, displayed over the ten age groups.

Analysis was facilitated by visually examining line graphs, one for each of the four temperament scales depicting one line each for the percentage of males and females displaying preferences for a particular temperament style at each of the 10 ages. Model fitting began with the development of a regression equation that included the highest order polynomial term necessary for describing the developmental trends found in either male's or female's temperament preferences on each of the four temperament dimensions, thus ensuring that a sufficient number of age-by-gender interaction terms were included in the model. Specifically, age-by-gender interaction terms corresponding to each polynomial term included in the proposed model were added to the data set and the regression equation. For example, for extroversion, if visual analysis of the line depicting male preferences for extroversion shows one turn while the line depicting female preferences shows two turns, then a cubic polynomial term would be added to the data set and model, even though the line for males suggests the need for only a quadratic term. Additionally, interaction terms corresponding to the linear, quadratic, and cubic polynomial terms then would be added to the data set and regression equation.

The resulting model was tested using the likelihood-ratio approach to statistical testing to determine if its degree of complexity was necessary for describing the features of the data. First the interaction terms were dropped from the model to determine their utility. The difference between the likelihood statistics generated by the

full and reduced models being compared was computed. The resulting likelihood ratio was compared to a chi-square critical value. For the analyses described in this and the results section, the critical value for significance at the .05 level varied depending on the number of interaction terms dropped from the full model. Comparisons between two models yielding likelihood ratios greater than the critical value suggest that the full model with interaction terms should be retained and the analysis discontinued. Conversely, likelihood ratios less than the critical value suggest the complex model should be disregarded in favor of the reduced model without interaction terms.

If the reduced model described the data more accurately, analyses continued by working backward, removing the highest order term from the model and comparing the resulting two models to determine if a more accurate model for describing the data could be obtained.

Thus, continuing with the example, the cubic term would be dropped from the model to produce a quadratic model and the resulting two models would be compared. If the cubic model was determined to describe the features of the data more accurately than the quadratic model, then the cubic model would be retained and the analysis discontinued. However, if the quadratic model more accurately described the data, then cubic model would be discarded in favor of the quadratic model. Finally, the quadratic model was compared to the linear model by dropping the quadratic term.

The models were compared using the likelihood-ratio approach to statistical testing. First, the difference between the likelihood statistics generated by the two models being compared was computed. The resulting likelihood ratio then was compared to a chi-square critical value. For the analyses described in this and the results

section (i.e., without interaction terms), the critical value for significance at the .05 level with one degree of freedom is 3.84. Thus, comparisons between two models yielding likelihood ratios greater than 3.84 suggest that the more complex model should be retained. Conversely, likelihood ratios less than 3.84 suggest the complex model should be disregarded in favor of the more simple model.

While logistic regression are useful primarily for describing the major features of the data (i.e., trends and effects), chi-square analyses may further elucidate the significance of possible differences in temperament preferences displayed as a function of age and gender. Therefore, a final series of analyses employed chi-square tests conducted at each age level. A significance level of .05 was set for all analyses. Thus, p-values equal to or less than .05 indicated the groups are statistically different on a temperament dimension. A summary of the research questions, sample sizes, and significant relationships for chi-square tests are provided in Tables 2 through 5 of the results section.

CHAPTER 4
RESULTS

Question 1: Does the prevalence of extroversion-introversion styles change as a function of age and gender?

Logistic regression for the extroversion-introversion dimension. A complex model including polynomial terms up to a quadratic and quadratic interaction terms first was modeled. Interaction terms then were dropped from the model. Differences between the likelihood statistics generated by the full and reduced models indicate that the full or complex model should be retained:

$$10789.025 - 10771.127 = 17.89;\ 2df\ cv = 5.99;\ p < .05.$$

Thus, logistic regression procedures indicate an age by gender interaction effect. Graphically (see Figure 1), the effect may be represented best by two non-parallel lines with intersecting concave curves, one for each gender, with both female and males preferences for an extroverted style increasing between ages 8 and 13 and decreasing thereafter.

Chi-square analyses for age on the extroversion-introversion dimension. On the EI dimension, differences were not significant between ages 8 and 9 ($\chi^2 = .183$, $p > .05$). Preferences for extroversion increased between ages 9 and 10 ($\chi^2 = .002$, $p < .05$). Differences were not significant between ages 10 and 11 ($\chi^2 = .105$, $p > .05$). Preferences for extroversion increased between ages 11 and 12 ($\chi^2 = .003$, $p < .05$) and

12 and 13 ($\chi^2 = .000$, $p < .05$). Preferences for extroversion decreased between ages 13 and 14 ($\chi^2 = .000$, $p < .05$). Differences were not significant between ages 14 and 15 ($\chi^2 = .395$, $p > .05$) and 15 and 16 ($\chi^2 = .469$, $p > .05$). Preferences for extroversion decreased between ages 16 and 17 ($\chi^2 = .006$, $p < .05$).

Chi-square analyses for gender on the extroversion-introversion dimension. A higher percentage of 8-year-old and 9-year-old males preferred the extroverted style compared to 8-year-old ($\chi^2 = .000$, $p < .05$) and 9-year-old ($\chi^2 = .000$, $p < .05$) females. Gender differences were not significant for 10-year-olds ($\chi^2 = .351$, $p > .05$), 11-year-olds ($\chi^2 = .733$, $p > .05$) and 12-year-olds ($\chi^2 = .918$, $p > .05$). A lower percentage of 13-year-old males preferred the extroverted style compared to 13-year-old females ($\chi^2 = .019$, $p < .05$). Gender differences were not significant for 14-year-olds ($\chi^2 = .599$, $p > .05$), 15-year-olds ($\chi^2 = .601$, $p > .05$) and 16-year-olds ($\chi^2 = .138$, $p > .05$). A higher percentage of 17-year-old males preferred the extroverted style compared to 17-year-old females ($\chi^2 = .000$, $p < .05$).

Question 2: Does the prevalence of practical-imaginative styles change as a function of age and gender?

Logistic regression for the practical-imaginative dimension. A complex model including polynomial terms up to a quartic and quartic interaction terms first was modeled. Interaction terms then were dropped from the model. Differences between the likelihood statistics generated by the full and reduced models indicate that the full or complex model should be rejected in favor of the reduced model:

$$9239.520 - 9231.161 = 8.359; 4df\ cv = 9.49; p > .05.$$

The reduced model, or quartic without interaction terms, then was compared to one without a quartic term (i.e., cubic model). Differences between the likelihood statistics indicate that the quartic term is unnecessary for describing the data:

$$9239.754 - 9239.520 = .234,\ 1df\ cv = 3.84;\ p > .05.$$

Next, the cubic term was dropped from the data. Differences between the likelihood statistics indicate that cubic model is necessary for describing the features of the data:

$$9256.062 - 9239.754 = 16.308;\ 1df\ cv = 3.84;\ p < .05.$$

Thus, logistic regression procedures do not indicate an age by gender interaction. Graphically (see Figure 2), preferences may be represented best by one line showing a significant increase in a preference for an imaginative style between age 8 and 10. A significant return toward a balanced style is found between age 10 and 15. Preferences for an imaginative style increase again between the age of 15 and 17.

Chi-square analyses for age on the practical-imaginative dimension. Preferences for a practical style decreased between ages 8 and 9 ($\chi^2 = .000$, $p < .05$) and 9 and 10 ($\chi^2 = .023$, $p < .05$). Preferences for a practical style increased between ages 10 and 11 ($\chi^2 = .022$, $p < .05$). Differences were not significant between ages 11 and 12 ($\chi^2 = .778$, $p > .05$) and 12 and 13 ($\chi^2 = .634$, $p > .05$). Preferences for a practical style increased between ages 13 and 14 ($\chi^2 = .013$, $p < .05$). Differences were not significant between ages 14 and 15 ($\chi^2 = .452$, $p > .05$), 15 and 16 ($\chi^2 = .079$, $p > .05$), and 16 and 17 ($\chi^2 = .543$, $p > .05$).

Chi-square analyses for gender on the practical-imaginative dimension. Gender differences in preferences for the practical/imaginative style were not significant for 8-

year-olds (χ^2 = .257, p > .05). A higher percentage of 9-year-old males preferred the practical style compared to 9-year-old females (χ^2 = .043, p < .05). Gender differences were not significant for 10-year-olds (χ^2 = .147, p > .05), 11-year-olds (χ^2 = .108, p > .05), and 12-year-olds (χ^2 = .054, p > .05). A higher percentage of 13-year-old males preferred the practical style compared to 13-year-old females (χ^2 = .000, p < .05). Gender differences were not significant for 14-year-olds (χ^2 = .156, p > .05) and 15-year-olds (χ^2 = .595, p > .05). A higher percentage of 16-year-old males preferred the practical style compared to 16-year-old females (χ^2 = .018, p < .05). A lower percentage of 17-year-old males preferred the practical style compared to 17-year-old females (χ^2 = .012, p < .05).

Question 3: Does the prevalence of thinking-feeling styles change as a function of age and gender?

Logistic regression for the thinking-feeling dimension. A complex model including polynomial terms up to a quadratic and quadratic interaction terms first was modeled. Interaction terms then were dropped from the model. Differences between the likelihood statistics generated by the full and reduced models indicate that the full or complex model should be retained:

$$7831.020 - 7821.722 = 9.298;\ 2df\ cv = 5.99;\ p < .05.$$

Thus, logistic regression procedures indicate an age by gender interaction effect. Graphically (see Figure 3), the effect may be represented best by two declining non-parallel lines, one for each gender, showing females' preference for a thinking style declining more rapidly over time than males.

Chi-square analyses for age on the thinking-feeling dimension. Preferences for a thinking style decreased between ages 8 and 9 ($\chi^2 = .027$, $p < .05$). Differences were not significant between ages 9 and 10 ($\chi^2 = .892$, $p > .05$), 10 and 11 ($\chi^2 = .560$, $p > .05$), 11 and 12 ($\chi^2 = .986$, $p > .05$), 12 and 13 ($\chi^2 = .406$, $p > .05$), 13 and 14 ($\chi^2 = .745$, $p > .05$), 14 and 15 ($\chi^2 = .248$, $p > .05$), 15 and 16 ($\chi^2 = .096$, $p > .05$), and 16 and 17 ($\chi^2 = .204$, $p > .05$).

Chi-square analyses for gender on the thinking-feeling dimension. Significant gender differences were found at all age levels. A higher percentage of males at all ages preferred the thinking style compared to same age females at ages 8 ($\chi^2 = .000$, $p < .05$), 9 ($\chi^2 = .000$, $p < .05$), 10 ($\chi^2 = .000$, $p < .05$), 11 ($\chi^2 = .000$, $p < .05$), 12 ($\chi^2 = .000$, $p < .05$), 13 ($\chi^2 = .000$, $p < .05$), 14 ($\chi^2 = .000$, $p < .05$), 15 ($\chi^2 = .000$, $p < .05$), 16 ($\chi^2 = .000$, $p < .05$), and 17 ($\chi^2 = .000$, $p < .05$).

Question 4: Does the prevalence of organized-flexible styles change as a function of age and gender?

Logistic regression for the organized-flexible dimension. A complex model including polynomial terms up to a quadratic and quadratic interaction terms first was modeled. Interaction terms then were dropped from the model. Differences between the likelihood statistics generated by the full and reduced models indicate that the full or complex model should be retained:

$$8381.165 - 8375.072 = 6.093; 2df\ cv = 5.99; p < .05.$$

Thus, logistic regression procedures indicate an age by gender interaction effect. Graphically (see Figure 4), the effect may be represented best by two declining non-

parallel lines, one for each gender, showing males' preference for an organized style declining more rapidly than females between age 8 and 15. Girls consistently show stronger preferences for an organized style. A significant return toward an organized style is found between age 15 and 17.

Chi-square analyses for age on the organized-flexible dimension. Preferences for an organized style decreased between ages 8 and 9 ($\chi^2 = .000$, $p < .05$). Differences were not significant between ages 9 and 10 ($\chi^2 = .096$, $p > .05$). Preferences for organized style decreased between ages 10 and 11 ($\chi^2 = .000$, $p < .05$), 11 and 12 ($\chi^2 = .000$, $p < .05$), 12 and 13 ($\chi^2 = .002$, $p < .05$), 13 and 14 ($\chi^2 = .001$, $p < .05$), and 14 and 15 ($\chi^2 = .008$, $p < .05$). Differences were not significant between ages 15 and 16 ($\chi^2 = .549$, $p > .05$). Preferences for an organized style increased between ages 16 and 17 ($\chi^2 = .003$, $p < .05$).

Chi-square analyses for gender on the organized-flexible dimension. Significant gender differences were found at all age levels. A lower percentage of males at all ages preferred an organized style compared to same age females at ages 8 ($\chi^2 = .004$, $p < .05$), 9 ($\chi^2 = .000$, $p < .05$), 10 ($\chi^2 = .000$, $p < .05$), 11 ($\chi^2 = .000$, $p < .05$), 12 ($\chi^2 = .000$, $p < .05$), 13 ($\chi^2 = .000$, $p < .05$), 14 ($\chi^2 = .000$, $p < .05$), 15 ($\chi^2 = .000$, $p < .05$), 16 ($\chi^2 = .000$, $p < .05$), and 17 ($\chi^2 = .000$, $p > .05$).

Table 1

Preference frequency percentages by age and gender

	(N)	E	I	P	M	T	F	O	L
Male 8	(265)	49	51	47	53	75	25	88	12
Female 8	(266)	38	62	51	49	42	58	93	7
Total 8	(531)	44	56	49	51	59	41	90	10
Male 9	(324)	52	48	44	56	74	26	77	23
Female 9	(324)	40	60	38	62	33	67	90	10
Total 9	(648)	46	54	41	59	54	46	84	16
Male 10	(466)	52	48	36	64	75	25	74	26
Female 10	(466)	50	50	39	61	32	68	89	11
Total 10	(932)	51	49	37	63	54	46	82	18
Male 11	(587)	54	46	39	61	73	27	71	29
Female 11	(587)	53	47	43	57	33	67	82	18
Total 11	(1174)	54	46	41	59	53	47	77	23
Male 12	(560)	58	42	43	57	72	28	60	40
Female 12	(559)	58	42	39	61	33	67	77	23
Total 12	(1119)	58	42	41	59	53	47	68	32
Male 13	(581)	62	38	44	56	75	25	58	42
Female 13	(581)	66	34	37	63	28	72	70	30
Total 13	(1162)	64	36	41	59	52	48	64	36
Male 14	(460)	57	43	47	53	77	23	54	46
Female 14	(461)	59	41	43	57	29	71	63	37
Total 14	(921)	58	42	45	55	52	48	59	41
Male 15	(319)	57	43	47	53	74	26	46	54
Female 15	(320)	56	44	46	54	27	73	60	40
Total 15	(639)	56	44	46	54	50	50	53	47
Male 16	(204)	52	48	46	54	69	31	44	56
Female 16	(205)	57	43	38	62	22	78	65	35
Total 16	(409)	54	46	42	58	45	55	55	45
Male 17	(184)	54	46	35	65	66	34	54	46
Female 17	(183)	40	60	45	55	19	81	72	28
Total 17	(367)	47	53	40	60	42	58	63	37
Male	(3950)	56	44	43	57	74	26	63	37
Female	(3952)	54	46	41	59	30	70	77	23
Total	(7902)	55	45	42	58	52	48	70	30

Note. N = Sample Size; E = Extroverted; I = Introverted; P = Practical; M = Imaginative; F = Feeling; O = Organized; L = Flexible

Table 2

Summary of chi-square results for extroversion/introversion dimension

Age comparisons	
8-year-olds to 9-year-olds	
9-year-olds to 10-year-olds°	*
10-year-olds to 11-year-olds	
11-year-olds to 12-year-olds°	*
12-year-olds to 13-year-olds°	*
13-year-olds to 14-year-olds°	*
14-year-olds to 15-year-olds	
15-year-olds to 16-year-olds	
16-year-olds° to 17-year-olds	*

Gender comparisons	
8-year-old males° to 8-year-old females	*
9-year-old males° to 9-year-old females	*
10-year-old males to 10-year-old females	
11-year-old males to 11-year-old females	
12-year-old males to 12-year-old females	
13-year-old males to 13-year-old females°	*
14-year-old males to 14-year-old females	
15-year-old males to 15-year-old females	
16-year-old males to 16-year-old females	
17-year-old males° to17-year-old females	*

Note. * denotes $p \leq .05$. ° denotes the group that is higher on Extroversion.

Table 3

Summary of chi-square results for practical/imaginative dimension

Age comparisons	
8-year-olds° to 9-year-olds	*
9-year-olds° to 10-year-olds	*
10-year-olds to 11-year-olds°	*
11-year-olds to 12-year-olds	
12-year-olds to 13-year-olds	
13-year-olds to 14-year-olds°	*
14-year-olds to 15-year-olds	
15-year-olds to 16-year-olds	
16-year-olds to 17-year-olds	

Gender comparisons	
8-year-old males to 8-year-old females	
9-year-old males° to 9-year-old females	*
10-year-old males to 10-year-old females	
11-year-old males to 11-year-old females	
12-year-old males to 12-year-old females	
13-year-old males° to 13-year-old females	*
14-year-old males to 14-year-old females	
15-year-old males to 15-year-old females	
16-year-old males° to 16-year-old females	*
17-year-old males to 17-year-old females°	*

Note. * denotes $p \leq .05$. ° denotes the group that is higher on Practical.

Table 4

Summary of chi-square results for thinking/feeling dimension

Age comparisons	
8-year-olds° to 9-year-olds	*
9-year-olds to 10-year-olds	
10-year-olds to 11-year-olds	
11-year-olds to 12-year-olds	
12-year-olds to 13-year-olds	
13-year-olds to 14-year-olds	
14-year-olds to 15-year-olds	
15-year-olds to 16-year-olds	
16-year-olds to 17-year-olds	

Gender comparisons	
8-year-old males° to 8-year-old females	*
9-year-old males° to 9-year-old females	*
10-year-old males° to 10-year-old females	*
11-year-old males° to 11-year-old females	*
12-year-old males° to 12-year-old females	*
13-year-old males° to 13-year-old females	*
14-year-old males° to 14-year-old females	*
15-year-old males° to 15-year-old females	*
16-year-old males° to 16-year-old females	*
17-year-old males° to17-year-old females	*

Note. * denotes $p \leq .05$. ° denotes the group that is higher on Thinking.

Table 5

Summary of chi-square results for organized/flexible dimension

Age comparisons	
8-year-olds° to 9-year-olds	*
9-year-olds to 10-year-olds	
10-year-olds° to 11-year-olds	*
11-year-olds° to 12-year-olds	*
12-year-olds° to 13-year-olds	*
13-year-olds° to 14-year-olds	*
14-year-olds° to 15-year-olds	*
15-year-olds to 16-year-olds	
16-year-olds to 17-year-olds°	*
Gender comparisons:	
8-year-old males to 8-year-old females°	*
9-year-old males to 9-year-old females°	*
10-year-old males to 10-year-old females°	*
11-year-old males to 11-year-old females°	*
12-year-old males to 12-year-old females°	*
13-year-old males to 13-year-old females°	*
14-year-old males to 14-year-old females°	*
15-year-old males to 15-year-old females°	*
16-year-old males to 16-year-old females°	*
17-year-old males to17-year-old females°	*

Note. * denotes $p \leq .05$. ° denotes the group that is higher on Organized.

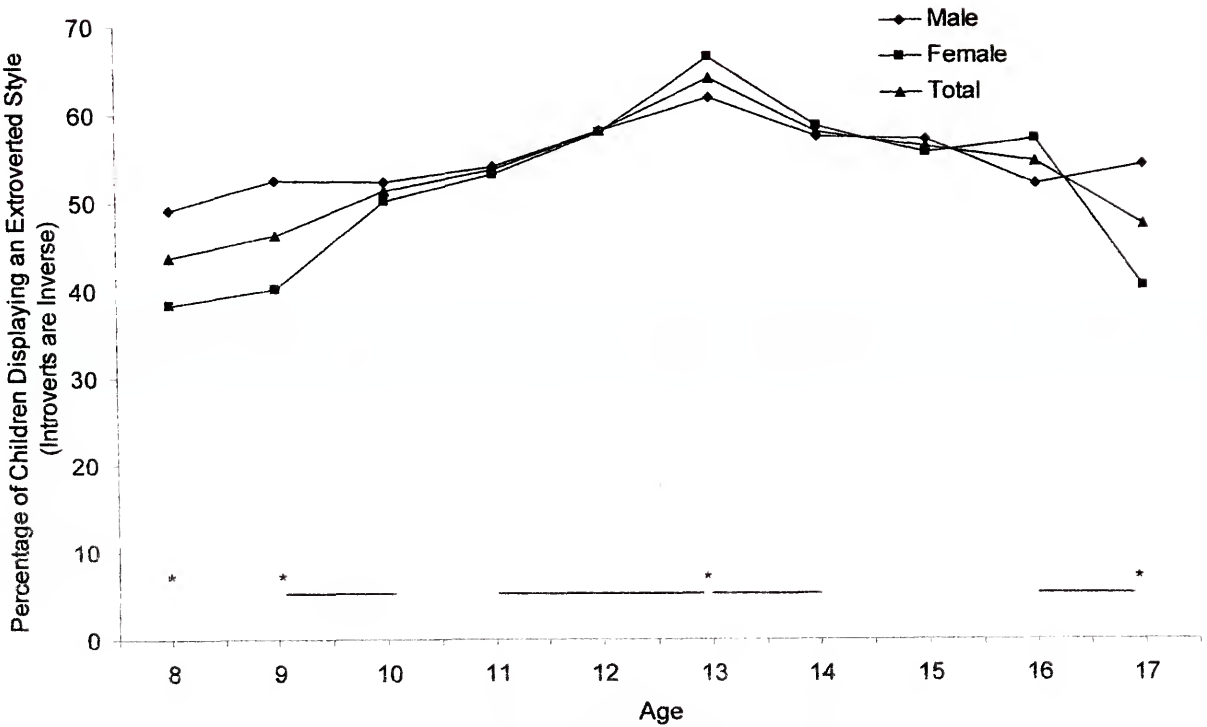

Figure 1. *Percentage of children who display an extroverted style across ten age groups.* Age differences are signified by solid lines. Gender differences are signified by an asterisk.

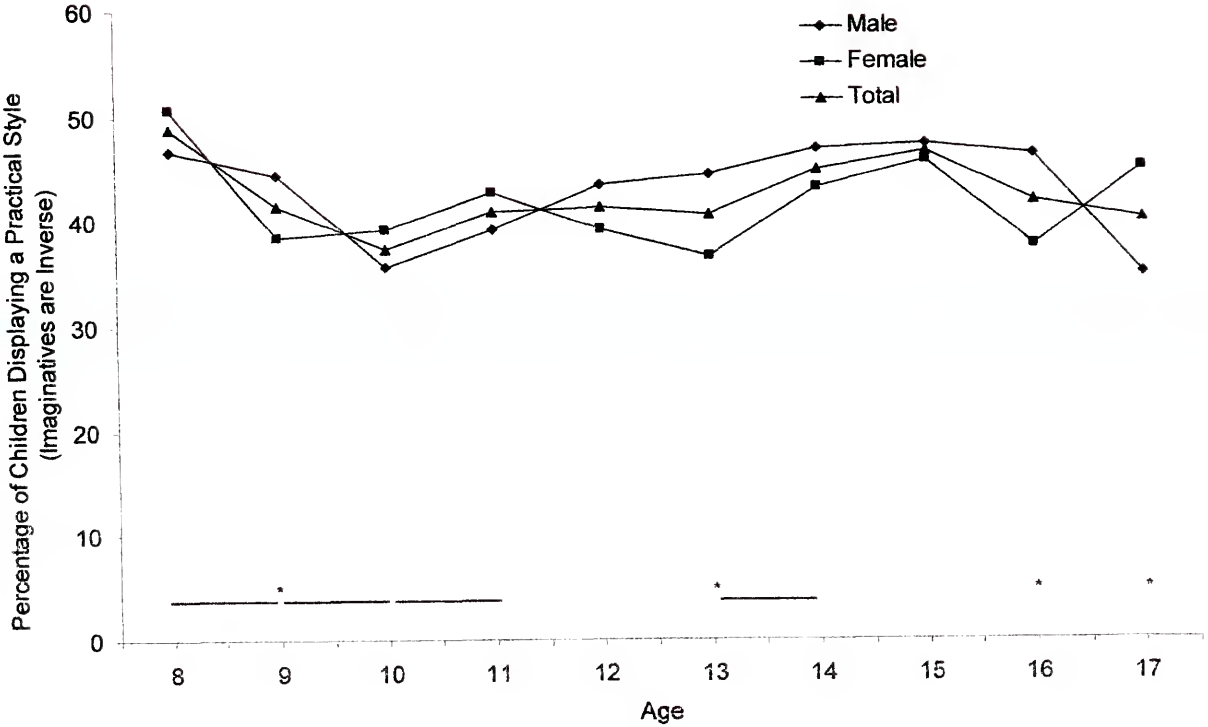

Figure 2. *Percentage of children who display a practical style across ten age groups.* Age differences are signified by solid lines. Gender differences are signified by an asterisk.

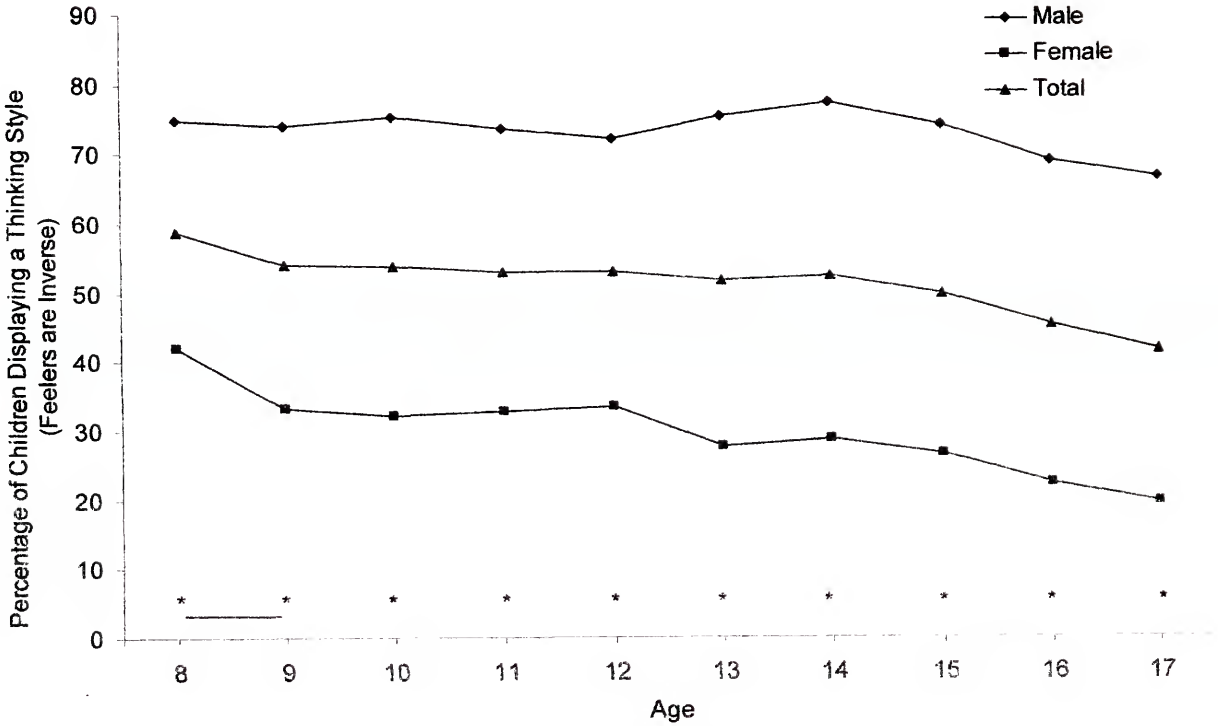

Figure 3. *Percentage of children who display a thinking style across ten age groups.*
Age differences are signified by solid lines. Gender differences are signified by an asterisk.

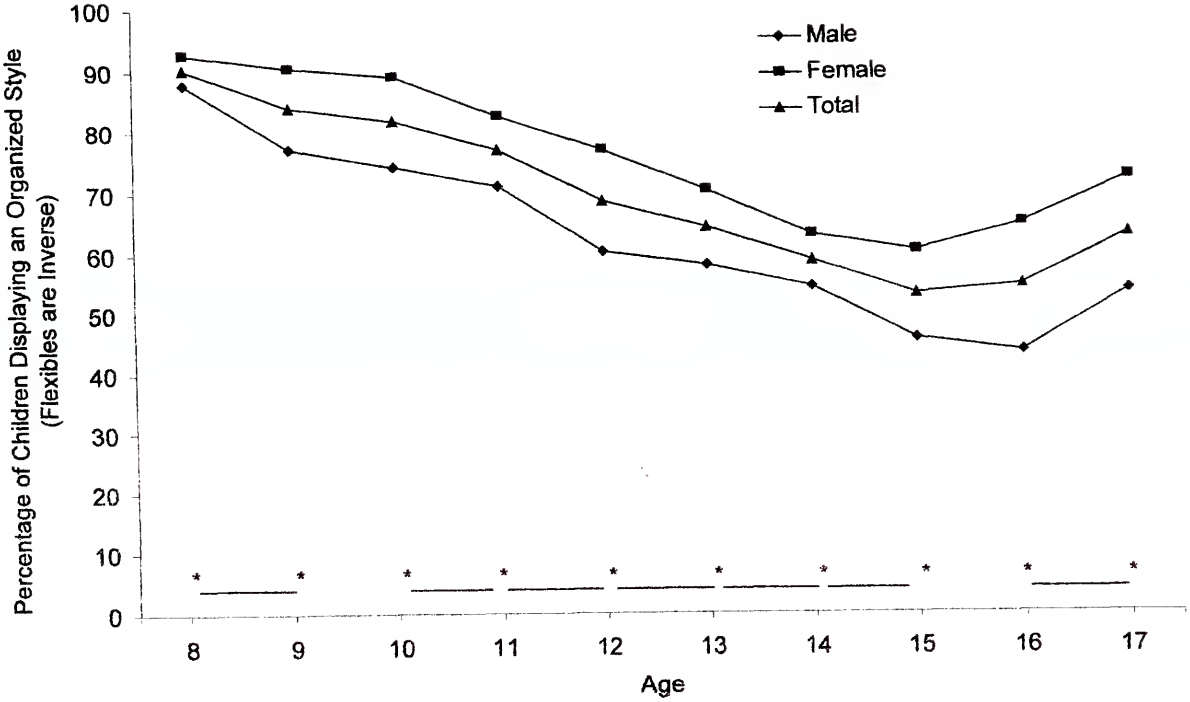

Figure 4. *Percentage of children who display an organized style across ten age groups.* Age differences are signified by solid lines. Gender differences are signified by an asterisk.

CHAPTER 5
DISCUSSION

Preferences for an Extroverted or Introverted Style

Preferences for extrovertion and introversion are impacted by age and gender. Graphically, the effect may be represented best by two non-parallel lines with intersecting concave curves, one for each gender, with preferences for an extroverted style increasing between age 8 and 13 and decreasing thereafter for both females and males. Gender differences in EI preferences are evident at only four of the ten age levels; 8, 9, 13, and 17. Thus, the most notable finding may be that initial preferences for a somewhat balanced perspective for extroversion and introversion seen in early childhood gives way to a significant shift toward a more extroverted style in later childhood, asymptoting during the early teens. A preference for an extroverted style peaks at age 13 and returns toward a more balanced preference for extroversion and introversion at later ages.

From a classic psychoanalytic viewpoint, the psychosocial goal of adolescence is the severance of emotional attachment and dependencies from parents (Freud, 1958). Detachment makes possible mature autonomy and later attachment to extrafamilial objects. From a Freudian perspective, this process leads to repudiation of parents and an orientation toward peers.

While childhood and adolescence may be marked by a shift away from the influence of parents toward greater peer influence (Ambert, 2001), psychoanalytic viewpoints for explaining this phenomenon have been downplayed over the past half

century due to a lack of empirical support for the theories as well as the development of alternative interpretations. For example, adolescents may turn away from the family and toward peers for companionship because peers are seen to be more socially and emotionally supportive than parents (Furman & Buhrmester, 1992).

Another alternative suggests that adolescents turn to outside social networks and activities because parents encourage them to do so. According to typical Western definitions of adjustment, children are considered to be well functioning and normal when they are eager to invest their energy in active and independent exploration of their immediate physical and social environment (Matas, Arend, & Sroufe, 1978). Thus, Western families generally expect children to become physically and psychologically separated from parents (Steinberg & Silverberg 1986) and encourage children to acquire a repertoire of social skills, experiment with interpersonal relationships, assume new behaviors, and engage in new experiences (Higgins & Parsons, 1983). Moreover, the role of the parents is not necessarily replaced by a peer system during this period; rather, the child may move quite comfortably between the two worlds (Brown, Mounts, Lamborn, & Steinberg, 1993). In other words, adolescence may represent another stage in life, one in which understanding of family has been established and understanding of peers becomes better rooted.

Regardless of ideology, each of the models described above suggests that an expanding social network marks the periods of childhood and adolescence. Both the number of peers and time spent interacting with peers increase during childhood and adolescence. Some report a linear increase in daily social contact with peers between early childhood and middle childhood (Feiring & Lewis, 1989). At age 3, children reportedly have an average of 22 people in their networks beyond their immediate

family members. Although peer network size did not change at age 6, a 70% increase in number of peers was observed between ages 6 and 9; by age 9 the average number of peers increased to 39 people. The trend toward increasing peer contact continues into late childhood as preadolescents spend more time with friends and develop a larger number friends (Bee, 1995; Feiring & Lewis, 1991). By adolescence, more time is spent interacting with peers than with other social partners (e.g., parents, teachers). Teenagers generally spend more than half of their waking hours with their peers (Berndt, 1999; Csikszentmihalyi & Larson, 1984). Notably, this period also is marked by an increase in cross-gender interactions. This may be a result of the discovery of one's sexuality and burgeoning interest in romantic relationships (Berndt, 1999, Crockett, Losoff, & Petersen, 1984).

The proclivity toward larger social networks and more frequent social interactions through childhood and adolescence may be adaptive. Erikson (1968) believed that self-concept is forged by exploring a variety of identities, a process that requires shifting one's crowd membership several times in order to sample a range of provisional identities. Sullivan (1953) also emphasized a critical role played by peers in one's self development. A central theme of his theory is that peer interactions provide opportunities for validation of self-worth and a unique context for exploration and development of personal strengths. Given the value of peer relationships during adolescence, some previously introverted children prefer extroverted qualities and thus seek more peer orientation and friendships with peers with whom they can interact on an equal footing.

Sullivan further proposed that peer relations may be a primary source from which arise critical characteristics of the mature personality. Indeed, peer interactions

are conducive to the development of a host of adaptive social behaviors including an understanding of fairness, proclivities toward sharing and kindness, mastery of symbolic expression, perspective-taking and communication skills, and skills in negotiating and managing conflict (Damon & Phelps, 1989; LeMare & Rubin, 1987; Parker, Rubin, Price, & DeRosier, 1995).

Peer interactions also are predictive of later emotional and social adjustment. More specifically, the sociability of children ages 7 through 12 is predictive of behavior and social competencies 7 years later. Elementary school students who were relatively socially isolated are more likely to display less suitable social skills and various kinds of psychological disturbance as adolescents (Morrison & Masten, 1991). In addition, withdrawn children are less likely to independently generate solutions to hypothetical social problems and display more rigidity in generative alternative solutions to problems (Rubin, 1982).

The possible restructuring of one's peer network to include a larger number of peers and more frequent interactions with them also may provide a functional value in school settings. As students transition from elementary to middle schools, they typically move from self-contained classrooms to larger, constantly shifting classes with many classmates they have not seen before (Brown, 1989). To the extent that peers provide mutual support and guidance (Moran & Eckenrode, 1991), increased interaction with peers in different groups may help them navigate these changes. Indeed, for many, being a member of a group is more important in early and middle adolescence (i.e., seventh through tenth grades) than at prior or later ages (Furman, 1989).

Research with infrahumans also suggests that social contact is essential to normal development (Harlow, Dodsworth, & Harlow, (1965). For example, in social

animals, the effects of social isolation, diminished social contact, and modified patterns of social contact resulted in less adequate social development, pathological affective states, inappropriate sexual behavior, and inadequate development of parenting skills.

Results of the current investigation show a return toward a more introverted style after age 13. Data from other studies of children and youth that may help corroborate this finding could not be located. However, adult data address this issue. Renorming data from the MBTI suggest that a trend toward an introverted style may continue into early adulthood (Hammer & Mitchell, 1996). Adults displayed a greater preference for an introverted style than do children less than 18 years of age.

Additional research supports the existence of a trend toward a decrease in a preference for an extroverted style as adults mature. For example, sociability declines for college freshman reassessed after 14 years (Mortimer, Finch, & Kumka, 1982). Similarly, research with the Five Factor model of personality also shows that extraversion, a measure of quantity and intensity of interpersonal interaction, decreases in adulthood (Costa & McCrae, 1994). These results were replicated in several large cross-national investigations, thus suggesting that adult personality development, in part, is due to biologically based maturation (Costa et al., 2000; McCrae et al., 1999).

Theoretical interpretations also support empirical findings that show a return toward an introverted style. Older adolescents may begin to realize that impending high school graduation will bring an end to a social world that has helped define their lives for years (Berndt, 1999). Having negotiated the intricacies of school life and developed a sense of identity and social competence (Ambert, 2001), being part of a peer group may become less critical (Furman, 1989). Thus, late adolescence may be marked by a

shift toward finding and building abiding relationships with a few close friends-a mark of an introvert (Epstein, 1989).

Interestingly, Dunphy (1963) may have captured developmental preferences along the EI dimension in his comprehensive effort to describe structural transformations in peer groups across adolescence. From observations of several groups of teenagers, supplemented with interview and diary data, Dunphy identified five stages of peer group structure. Stage one occurs in early adolescence and is characterized by unisexual cliques consisting of four to six close friends. In stage two, opposite gender cliques begin to draw together as a result of the budding heterosexual interests. In stage three, heterosexual cliques form, and a crowd begins to develop. In stage four, roughly between the ages of 13 and 15, the fully developed crowd consisting of a close association of heterosexual cliques emerges. In stage five, toward the end of adolescence, crowds disintegrate into relatively isolated cliques reminiscent of early adolescence, except that the groups are heterosexual.

This discussion seemingly couches the EI dimension in terms of one's peer network size and quantity of time spent interacting with peers. While these certainly are central tenants of an extroverted and introverted style, this may appear on the surface to be a narrow conceptualization of the EI dimension. No doubt, qualities associated with the EI dimension extend beyond social-oriented concepts. However, when considering that peers often are the ones with whom children discover new enterprises and interests, assume new behaviors and engage in new experiences, talk and learn about themselves and others, and develop answers to questions of "who am I?" and "what will I become?" (Asher, Parkhurst, Hymel, & Williams, 1990; Bagwell, Newcomb, & Burkowski, 1998; Berk, 1994; Brown, 1989; Feiring & Lewis, 1989; Higgins &

Parsons, 1983), then the extent of the peer network and time spent interacting with peers may be viewed as a bell weather for assessing preferences on the EI dimension.

Preferences for a Practical or Imaginative Style

Gender appears to be a non-pervasive influence on forming preferences for a practical or imaginative style. Compared to girls, boys are more likely to display preferences for a practical style at three ages (i.e., 9, 13, and 16) and for an imaginative style at one age (i.e., 17).

Several relatively short developmental trends are evident in the data. More specifically, a significant shift from a somewhat balanced perspective toward a more imaginative style is found between age 8 and 10. A gradual yet significant return toward a more balanced style occurs between age 10 and 15. Finally, another shift toward an imaginative style is found between age 15 and 17. While these developmental trends are intriguing, their significance can be minimized in that comparatively few differences in PM preferences are found across each of the ten age levels. Therefore, the most notable finding may be that children and adolescents display a somewhat consistent preference, albeit at times mild, for an imaginative style.

These results are incongruent with MBTI renorming data that show U.S. adults prefer a sensing (i.e., practical) style (Hammer & Mitchell, 1996). However, the renorming results also show that adults displayed greater preferences for a sensing (i.e., practical) style than do children less than 18 years of age. Thus, the results of the current investigation together with the MBTI renorming study suggest a significant shift from an imaginative style toward a practical style occurs across late adolescence, young adulthood and into adulthood.

Unfortunately, there appears to be a dearth in related theory and research addressing the notion of such a developmental trend. However, indications that late adolescence may be a stage during which young people begin to think less imaginatively and more realistically about the paths that their futures might take (Nurmi, 1989) and display a preoccupation with economic well being and societal expectations (Jessor, 1983) suggest that a shift toward a more practical style in young adulthood is plausible.

Preferences for a Thinking or Feeling Style

Preferences for thinking and feeling styles are impacted by gender and to a lesser extent age. Graphically, the effect may be represented best by two declining non-parallel lines, one for each gender, showing females' preference for a thinking style declining more rapidly over time than that for males. The prevalence of a thinking style among males generally is stable between ages of 8 and 17. In contrast, age level differences in the direction of an increasingly stronger preference for a feeling style are evident among females. More specifically, among females, 58 percent show a preference for a feeling style at age 8 while approximately 81 percent show a preference for a feeling style at age 17.

The most notable finding is that males consistently display a strong preference for a thinking style while females consistently display preferences for a feeling style. These results are congruent with cross-national findings that show males also display stronger preferences for a thinking style than do females among Australian and Chinese adolescents (Bassett, 2001; Oakland, Faulkner, & Bassett, in press). Moreover, these results also are consistent with the renorming data from the MBTI that show adult males

prefer a thinking style whereas adult females prefer a feeling style (Hammer & Mitchell, 1996).

Some evidence suggests biological factors may explain these preferences. Genetic coding, with males displaying greater relative strength and lung capacity, may make them better suited for the competitive struggle to obtain resources necessary for survival. In contrast, females, with childbearing and milk-production capacities, may be predisposed to nurturing roles (Whyte, 1998). Brain differences also may help explain these gender differences. Women's better verbal expression of emotions may be explained by the fact that the right hemisphere of the female brain, which controls emotions, is better connected to the left side of the brain, which controls verbal expression, than is the case for men (Moir & Jessel, 1989). In contrast, females greater reliance on their feelings may have helped develop this hemispheric difference. Differences in emotional reactions of men and women also have been attributed to differential hormonal responses (Fischer, 1998).

However, most sociobiologists are likely to acknowledge that environmental factors also may help explain these behavioral differences among males and females (Whyte, 1998). Indeed, psychoanalytic and socialization perspectives provide an interesting forum for explaining these gender preferences. According to Freud, the establishment of gender identity is a major developmental milestone in early childhood. By age 3, almost all children identify themselves as either a boy or girl (Pogrebin, 1980: Thompson, 1975) and begin to develop organized beliefs regarding qualities that constitute femaleness and maleness (Bem, 1981). In Western cultures, masculinity is assigned attributes of competitiveness and self-reliance. Femininity is assigned attributes of emotional expressiveness, sensitivity, and nurturance (Ruble, 1983). These

and other gender-related beliefs may strengthen as children evaluate their adequacy based on conformity to culturally defined role requirements regarding the way they should think and behave (Bem, 1983). The development of this dichotomous arrangement in gender-related beliefs and behavior also is evident in Western countries with more liberal attitudes (Goldman & Goldman, 1982).

Research in child-rearing practices suggests that preferences for a thinking or feeling style may be learned. According to a feminist version of psychoanalysis, mothers relate to their sons and daughters differently (Chodorow, 1999). While fusing identities with their daughters, mothers relate to their sons as being separate and distinct. Consequently, young males and females often approach relationships differently; girls are more inclined to adopt styles marked by connectedness while boys are likely to prefer independence and autonomy.

Mothers talk more about emotions and a greater variety of emotions with daughters than sons. Moreover, girls talk more about emotion and about a greater variety of emotions than do boys. Additionally, girls initiate more emotion-related discussions than do boys (Kuebli, Butler, & Fivush, 1995). Similarly, adolescent boys have fewer intimate relationships than do girls (Berndt, 1999; Youniss & Smollar, 1985).

Social learning and behavioral theories suggest that gender-related personality styles develop as result of social reinforcement (Bandura & Walters, 1963). Parents encourage children to engage in activities considered sex appropriate (Lytton & Romney, 1991). In Western cultures, girls generally receive praise and attention for their interest in feminine toys or activities while boys are positively reinforced for their interest in masculine toys or activities (Fagot & Hagan, 1991; Lytton & Romney, 1991).

Children also develop gender-related focal concerns (i.e., specific sets of values, interests, and problems central to peer culture) (Adler, Kless, & Adler, 1992). Boys' focal concerns often center on competition, self-reliance, and a culture of coolness and detachment. In contrast, girls' focal concerns often center on compliance and conformity, intimacy, emotional expression, and a culture of romantic love.

Adult females tend to be more expressive, emotion oriented, and nurturing while adult males tend to be more self-reliant, emotionally detached, and competitive. One large study of college students from 30 countries found that men consistently are described as adventurous, strong, dominant, assertive, task-oriented, aggressive, enterprising, and independent. In contrast, women are consistently described as sensitive, gentle, dependent, emotional, sentimental, weak, submissive, and people oriented (Williams & Best, 1990). Women's social relationships are more dyadic and intimate while men's friendships tend to focus on activities of an emotionally detached nature such as sports or the completion of a task (Parker & de Vries, 1993; Wright, 1982). Women are more empathetic to other people (Eisenberg & Lennon, 1983), are more willing to discuss their emotional experiences with others (Dindia & Allen, 1992), and do so more overtly and with more confidence (Fischer, 1998). In short, results appear to suggest that women emphasize social and emotional interdependence with other people, whereas men emphasize independence.

Gender differences in public policy attitudes and work values also are evident. For example, from a public policy perspective, women are more supportive of programs that enhance people's well-being such as education, health programs, and social welfare (Eagly, 1987; Schlozman, Burns, Verba, & Donahue, 1995; Shapiro & Mahajan, 1986). With regard to employment attitudes, women are more likely to attach importance to

jobs that are worthwhile to society and help others (Beutel & Marini, 1995; Marini, 1990).

Confirmatory evidence indicating the presence of gender differences in a preference for a thinking or feeling orientation also can be found in research on leadership styles. Managers generally are concerned with two aspects of their work. The first, task accomplishment, concerns organizing activities to perform assigned tasks. The second, maintenance of interpersonal relationships, focuses on tending to the morale and welfare of the people in a work setting. Women are more concerned than men with both the maintenance of interpersonal relationships and task accomplishment (Eagly & Johnson, 1990).

Scholarship on democratic versus autocratic style further elucidates gender differences in the leadership orientations of managers. Democratic leadership is marked by a participative style that encourages the contributions of subordinates in the decision-making process. In contrast, autocratic leadership, is marked by a directive style that discourages subordinates from participating in the decision making process. Once again, women display a more democratic leadership style. More specifically, women are more likely to use the collaborative style whereas men are more likely to employ a directive style.

Gender differences in preferences for a transactional or transformational style also have been investigated (Powell & Graves, 2003). A transactional orientation is characterized by command and control leadership whereas a transformational orientation is characterized by shared power and information and enhancement of others self-worth (Rosener, 1990). Females are more likely to favor transformational leadership styles than their male counterparts.

Literature on the development of moral judgment also appears to underscore differences males and females display in their preferences for a thinking or feeling style. According to Kohlberg (1969), each of the six stages of moral judgment builds on the reasoning of the preceding stage. Stages 3 and 4 are of particular interest for the purposes of this study. At stage 3, moral understanding is based on the individual's desire to promote social harmony. At stage 4, moral judgment encompasses a larger perspective including societal laws and justice. Kohlberg reported that the average stage of moral development is 4 for men, and 3 for women (Kohlberg & Kramer, 1969).

Gilligan (1982) is fundamentally dissatisfied with Kohlberg's interpretations suggesting that the "goodness" of women (e.g., their care for and sensitivity to the needs of others) leads them to be classified at only stage 3 of moral development. She argues that Kohlberg places too much emphasis on a justice orientation and too little emphasis on a caring orientation. In her view, multiple moral orientations are possible and an ethic of care is different, but no less a valid basis for moral judgment compared to an ethic of justice. Despite these differences, both Kohlberg and Gilligan agree that, when making moral judgments, men are more likely to consider principles of fairness while women are more likely to consider compassion.

At least one other observation regarding gender related preferences for a thinking/feeling style is noteworthy. When considering U.S. heritage, the notion that males display a preference for a thinking style is not entirely unexpected. At the time of its formation, the framers of the U.S. constitution, all men, created a form of government that stressed uncommon ideals of justice and equality (de Tocqueville, 1835/1984, Potter, 1970).

Preferences for an Organized or Flexible Style

A developmental trend in preferences for an organized-flexible style is evident. More specifically, a significant shift from an initially strong preference for an organized style toward a more balanced style perspective is evident between the age of 8 and 15. However, a significant return to a preference for an organized style is observed between the age of 15 and 17.

One observation is especially noteworthy. At every age, the majority of students show a preference for an organized style. These findings are consistent with those from the renorming data of the MBTI that show the majority of U.S. adults prefer a judging (i.e., organized) style (Hammer & Mitchell, 1996).

One may reference culture-based factors to help explain a preference for an organized style. From a historical perspective, evidence suggests that a preference for an organized style, characterized by a strong work ethic and achievement, is valued in U.S. society. Almost from the start, settlers in America believed that hard work and education pay off. For example, John Wesley, who founded the Methodist church, exalted entrepreneurial success and urged his followers "to gain all they can, and to save all they can; that is, in effect, to grow rich" (Weber, 1904/1958, p. 175). The American dream has been described as the "pursuit of individual salvation through hard work, thrift, and competitive struggle" (Whyte, 1956, p. 4).

The achievement orientation also was evident in the frontiers of the West. While land was inexpensive, the lack of a division of labor forced people to be self-reliant (Potter, 1970). Francis J. Grund, an Austrian born journalist in the United States, noted "there is probably no people on earth with whom business constitutes pleasure, and

industry amusement, in an equal degree with the inhabitants of the United States of America" (Grund, 1837/1971, p. 1).

A strong work ethic remains a central feature of American character. A dominant view held among Americans today is that leisure time ought to be used in a productive manner (Yankelovich, 1994) and the United States consistently ranks as one of the most task-oriented nations in the world (Trompenaars, & Hampden-Turner, 1997). Americans work longer hours than their European and Japanese counterparts (Economist, 1994a; Bell & Freeman, 1994) and, in contrast to Europe, where status is attributed by birth, gender or age, Americans are more likely to approve merit-based reward systems (Trompenaars & Hampden-Turner, 1997).

An achievement orientation also is reflected in the value American's place on education for success. In contrast to European culture, where welfare and other public policies are more widely accepted as means for helping less affluent, Americans place greater emphasis on achieving social mobility through investment in education (Lipset, 1996). The United States spends more of its gross domestic product on education than do countries in the European Union or Japan (Economist, 1994b) and the United States historically leads the world in the proportion of young people attending elementary school, high school, and college (Lipset, 1996). The proportion of 20- to 24-year-olds in higher education in the United States is almost double that of Japan and the most affluent European countries (Hampden-Turner & Trompenaars, 1993).

Child-rearing practices may play a role in preferences for an organized style. In Western cultures, parents admire children when they achieve by their own effort (Hofstede, 1980; Triandis, 1995). Such ideology likely perpetuates an achievement orientation from one generation to the next.

As noted previously, adolescents display a significant and gradual shift toward a preference for a more flexible style between the age of 8 and 15. Similar results have been reported in cross-national research. Australian and Chinese adolescents increasingly show a stronger preference for a flexible style between the age of 9 and 15 (Bassett, 2001; Oakland, Faulkner, & Bassett, in press).

Developmental and psychoanalytic perspectives may be useful in explaining this trend. During preadolescence, when an organized style is most pronounced, children are most likely to accept parental views because they are viewed as most knowledgeable and dependable (Kaplan, 1991; Selman, 1980; Smollar & Youniss, 1989; Weissman, Cohen, Boxer, & Cohler, 1989). Deference to authority during this stage may be adaptive. An incentive for children to learn to behave in ways that ensure parents' affection is strong (Sullivan, 1953). Children may experience feelings of love and acceptance when parental values are internalized and, consequently, work to correct tendencies or impulses that would incur disapproval or abandonment (Sullivan, 1953).

However, beginning in middle childhood, changes occur in children's susceptibility to parental influence (Berndt, 1979). Whether prompted by parents' attitudes suggesting that they become more autonomous in functioning (Baltes & Silverberg, 1994; Baumrind, 1971; Maccoby & Martin, 1983; Steinberg & Silverberg, 1986), by psychosocial goals of detaching from parental ties (Erikson, 1968; Freud, 1958; Sullivan, 1953), or the onset of the realization of the fallibility of parents (Steinberg & Silverberg, 1986), increasing opposition to adult authority marks the period between childhood and adolescence (Kearney, 1998). Indeed, middle adolescence has been characterized as a time of acting out and experimentation with different forms of subjectivity (Kearney, 1998). Adolescents often characterize their

subordinate position in the family and adult control over their activities as restrictive and irksome (Mayall, 1999). Beginning around the age of 11 or 12, issues such as choice or timing of activities often generate conflict. Children often demand more negotiation and flexibility in their approach to matters rather than simply accepting parents' absolute authority (Ambert, 1997).

Some congruence exists between when adolescents show the greatest preference for a flexible style and their likelihood to engage in risky or rule-breaking behavior. The beginning of adolescence has been characterized as a time of experimentation with antisocial activities (Berndt, 1979). Adolescents report higher levels of involvement in antisocial activities (Steinberg & Silverberg, 1986). Problem behaviors in youth peak around ages 15 and 16 across cultures and generations (Gottfredson & Hirischi, 1990; Kennedy, 1991; Lore & Schultz, 1993). Arrest rates among U.S. teens ages 15 to 17 are higher than at any other time across the life-span (Bee, 1995). However, the period of delinquency may be short-lived and serve as a springboard for reconciliation with prevailing cultural and parental attitudes and beliefs (Kaplan, 1991; Smollar & Youniss, 1989; Steinberg & Silverberg, 1986; Weissman, Cohen, Boxer, & Cohler, 1989).

The current investigation found a return toward a more organized style between the age of 16 and 17. The renorming data from MBTI suggest that this trend may continue into early adulthood (Hammer & Mitchell, 1996) as adults show a greater preference for a judging (i.e., organized) style than do children less than 18 years of age.

Other research seemingly supports the existence of this trend. Young adulthood may be marked by a damping of youthful protest as well as declines in susceptibility to peer pressure and tolerance of deviant behaviors (Berndt, 1979; Jessor, 1983) along

with concomitant increases in prosocial, conventional, and goal directed behavior (Costa et al., 2000). Research with the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985) shows that U.S. college students, both male and female, score higher than adult counterparts on openess to experience, characterized by experience seeking and flexibility, and lower than adults on conscientiousness, characterized by tempo, vigor, persistence, and goal-directed behavior increases (Costa & McCrae, 1994). Extensive cross-national results among adults also show that openness to experience decreases while conscientiousness increases with age (Costa et al., 2000; McCrae et al., 1999). Costa and McCrae imply that the consistency in results provides evidence for universal processes of adult development (Costa et al. 2000).

Results of the current investigation show that females consistently show stronger preferences for an organized style than do males. Once again, these findings flow nicely with renorming data from the MBTI that show adult females display a stronger preference for a judging (i.e., organized) style (Hammer & Mitchell, 1996).

Theories of gender and child-rearing practices may be useful in explaining these phenomena. Both mothers and fathers are more strict toward daughters (Grief, 1980), and daughters are more likely to be discouraged from taking risks (Hagan, Simpson, & Gillis, 1987). Consequently, females may encounter more pressure to adhere to social norms. Adolescent girls are more likely than boys to be concerned with issues of compliance and conformity (Adler, Kless, & Adler, 1992). In contrast, adolescent males are more likely to be risk takers, delinquent, arrested for committing serious crimes, and show higher levels of school maladaptation (Dishion, Poulin, & Skaggs, 2000; Hagan, Simpson, & Gillis, 1987; Kennedy, 1991; Siegel & Senna, 1991).

Cross-cultural research seemingly supports a perspective suggesting that preferences for either an organized or flexible style may be influenced by environmental factors. Previous research with Student Styles Questionnaire show that Chinese adolescents consistently display a strong preference for an organized style between ages 9 and 15 (Bassett, 2001; Oakland, Faulkner, & Bassett, in press). In contrast, U.S. adolescents' initial strong preference for an organized style steadily shifts toward a more balanced perspective between age 8 and 15. The greater emphasis Chinese culture places on themes of filial piety, strict discipline, proper conduct, acceptance of social obligations, and conformity and order through a hierarchical structure of social relationships (Bond & Hwang, 1986; Gow, Balla, Kember, & Hau, 1996; Vernon, 1982) may partially explain a strong cultural orientation for an organized style.

Implications of the Study

Results of this investigation question the use of the currently used prevalence-based T-score system when interpreting children's preferences for extroverted and introverted as well as for practical and imaginative styles. The prevalence rate of extroverted and practical styles among children may be lower than those reported in the SSQ manual. Additional research using the MBTI with children and adolescents is needed to explore these possibilities.

There appears to be significant changes in preferences for extroverted and organized styles during late adolescence. Results of this investigation also provide preliminary evidence for the existence of a significant shift toward a more practical lifestyle occurring between late adolescence and adulthood. Interestingly, these changes coincide with the onset of young adulthood. It is plausible that the new responsibilities of adulthood and the world of work (Costa et al., 2000) may significantly impact

preferences along these temperament dimensions during this time of change. Future research may elucidate the existence of these possibilities.

Results of the investigation reveal the presence of significant developmental trends and gender differences in preferences for temperament styles. These findings suggest that caregivers (e.g., parents, teachers, counselors, therapists) who are informed by knowledge about temperament styles can play a key role in promoting goodness of fit for children.

Limitations of the Study

Data obtained as a result of this investigation reveal that children and adolescents consistently prefer an imaginative style to a practical style. In contrast, MBTI renorming data show that young adults display a mild preference for an organized style and this preference increases into adulthood. Taken together, results suggest a significant shift from an imaginative style toward a practical style across late adolescence, young adulthood and into adulthood. One limitation of the study is the failure to identify related theory and research that addresses such a developmental trend.

Another limitation lies in the use of a normative sample stratified for race/ethnicity based on 1990 U.S. Bureau of the Census data. The population base rates for race/ethnicity have shifted somewhat during the past 15 years. For example, the growth of the Hispanic population has outpaced the growth of White and African American populations during this period. The possibility that there exist racial/ethnic differences in preferences for temperament styles implies that prevalence rates for temperament styles reported in this study may be somewhat dated.

Another limitation centers on the transformation of the data from their continuous T-score form to their simple dichotomous form. It is acknowledged that this

method of transforming the data resulted in the loss of some information. More specifically, the ability to identify the strength (i.e., mild, moderate, strong, very strong) of a child's temperament preferences is lost.

APPENDIX A
GENERAL CHARACTERISTICS OF TEMPERAMENT STYLES

General Characteristics of an Extroverted Style.

- Display an orientation toward the outer world of people and events
- Display energy and enthusiasm
- Draw energy form what is happening in their environment
- Feel more energetic after interacting with people
- Enjoy talking and interacting with others
- Respond quickly – plunging in first and considering and analyzing later – and thus appear impulsive
- Understand and develop ideas by discussing them with others
- Express ideas, opinions, and feelings to others readily and often
- Have a wide variety of interests
- Have many friends
- Be easy to get to know
- Enjoy large and small groups and taking a public role
- Be interested in activities that produce quick results
- Like to move from activity to activity and stay busy
- Enjoy interruptions and distractions
- Not be silent much and uncomfortable with silence
- Need compliments, affirmation, and encouragement from others

- Prefer talking to writing

General Characteristics of an Introverted Style.

- Display an orientation toward the inner world of thoughts and ideas
- Enjoy and need solitude and private time
- Develop their ideas by thinking about them before discussing them
- Feel more energetic and focused after spending time alone
- Respond slowly to environmental stimuli
- Hesitate, be cautious, and think before acting
- Have a few close friends with whom they spend time
- Enjoy working alone
- Be reserved and somewhat difficult to get to know
- Be slow to reveal feelings and opinions
- Be happy to listen to others without saying much
- Prefer to think about and understand a concept before doing a hands-on assignment that applies the concept
- Pay more attention to their own thoughts than what is happening around them
- Prefer individual work or small group work to large group work
- Want a space of their own where others do not intrude on their space or handle their belongings without permission
- Have a few interests that they pursue in depth

General Characteristics of a Practical Style.

- Pay attention to real things
- Pay attention to information that comes through the senses

- Be very observant of their environment and what is happening in it
- Enjoy using previously learned skills and experience to solve problems
- Be called realistic and pragmatic
- Enjoy and pay attention to the present
- Be suspicious of generalities and statements that are not backed by evidence
- Understand things literally
- Enjoy learning in a step-by-step fashion
- Notice details
- Make few factual errors
- Prefer simplicity over complexity
- Get discouraged when things seem to complicated
- Value tradition and work to maintain things that already exist
- Enjoy learning through hands-on work and involvement in activities
- Prefer learning and using facts to dealing with abstraction, possibilities, or theory
- Enjoy practicing skills already learned

General Characteristics of an Imaginative Style.

- See the world through their mind's eye
- Enjoy words, metaphors, and symbols
- Be creative
- Enjoy hearing a theory first and then the applications of the theory
- Learn by insight and intuitive leaps
- Value quickness of understanding

- Enjoy variety
- Enjoy learning new skills rather than dwelling on previously mastered skills
- Be called visionary
- Have many original ideas
- Be more interested in the future than in the present or past
- Enjoy change and innovation for their own sake
- Overlook details
- Make factual errors
- Enjoy complexity
- Skip steps but still come to a valid conclusion
- Be stimulated by difficulties
- Be inspired often
- Work very hard for a brief period of time and then rest
- Challenge existing practices and work to improve the future
- Enjoy learning for the sake of learning, not only if there are practical applications for what is learned

General Characteristics of a Thinking Style.

- Use objective standards to make decisions
- Be analytical and critical
- Tell the truth as they see it
- Value logic over sentiment
- Be skeptical, question others, and doubt what others say
- Be brief and businesslike in their speech and social encounters

- Enjoy analyzing facts and ideas
- Be consistent in their opinions, beliefs, and actions
- Treat people fairly
- Be uncomfortable expressing their emotions
- Give praise rarely
- Work to correct injustice

General Characteristics of a Feeling Style.

- Use personal standards to make decisions
- Be appreciative and sympathetic
- Be tactful and friendly
- Agree with others and seek to be in harmony with them
- Ramble when speaking and be slow to get to the point
- Be comfortable with emotional issues
- Give praise often
- Want to please others
- Trust others readily and have positive expectations of them
- Value feeling and sentiment over logic
- Be skilled in social affairs
- Understand and analyze people instead of facts or ideas
- Be compassionate and support projects that enhance people's welfare
- Shy away from conflict
- Be charming and charismatic

General Characteristics of an Organized Style.

- Like to make decisions, have things settled, and have closure
- Want to plan and have a schedule
- Want to work steadily
- Be persistent
- Want to finish things
- Want to reach conclusions
- Be dependable
- Respect authority
- Want to know about things ahead of time
- Dislike surprises
- Want to be right and do things the right way
- Want to control things
- Keep their space and possessions neatly arranged
- Want to know only the essentials of a situation or subject
- Think of time as structure and an opportunity to plan
- Have a sense of urgency about things in general

General Characteristics of a Flexible Style.

- Like to postpone decision-making and have things remain open-ended
- Want things to be open-ended and undecided
- Enjoy surprises
- Want to experience as much as possible
- Want to adapt to life as it comes

- Be tolerant of different viewpoints
- Prefer escaping rules
- Tolerate disorder among their possessions
- Seek opportunities to play and enjoy life
- Be flexible in their opinions and commitments
- Be witty, charming, and clever
- Enjoy performing
- Dislike the words *should* and *should not*

APPENDIX B
ADMINISTRATION PROCEDURES

Before Administration:

- Understand the nature and purposes of the SSQ.
- Make special arrangements for students who read below the third-grade level or exhibit other qualities that preclude their taking the SSQ in a group setting.
- Decide on a day and time for administering the SSQ. Avoid first and last class periods and days preceding holidays. Ensure that there is ample time: about 30 minutes for younger students and 20 minutes for older students.
- Decide on suitable seating arrangements and ensure there is adequate lighting and ventilation.
- Obtain SSQ materials: one Question Booklet and one Ready Score Answer Document or Record Form for Computer Key Entry for each student.
- Study the questionnaire and its directions carefully. Familiarize yourself with the questions and method of marking answers.
- Decide how best to distribute and collect the materials. Arrange materials for distribution.
- Decide what students who finish early should do.
- Announce the SSQ a day or two before administration. Inform students to bring and use pencils. Have a supply of pencils for those who forget theirs.

During Administration:

- Have students sharpen their pencils.
- Inform the students what to do if they complete the questionnaire early.
- Emphasize the importance of students' honestly responding to each item in terms of their preferences.
- Distribute materials. Caution the students not to begin until you tell them to do so.
- Instruct the students to write their name, age, grade, sex, race/ethnicity, teacher's name, and date on their answer form.
- Read the directions to the students exactly as given on the front of the SSQ Question Booklet.
- Answer any general questions.
- Remind the students to indicate their preferences when answering the items. Ask them to select only one of the two options for each item.
- Move quietly around the room to make sure students are marking answers in the correct place and continuing to the next page after finishing the current page. Encourage low motivated students to keep working and make sure there is no copying. Try to prevent outside interruptions.
- When students are finished, ask them to review the answer form to ensure they responded to all items and selected only one option per item.

After Administration:

- Arrange for those who did not finish the SSQ to complete it at a later time.
- Collect materials.

- Record any important student reactions or adverse testing conditions.
- Return Question Booklets and answer forms to the test coordinator if needed.

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BIOGRAPHICAL SKETCH

Kyle Dixon Basset was born in Albemarle, North Carolina. He graduated from South Plantation High School in Plantation, Florida. Kyle received his Bachelor of Arts degree in Business Administration (finance) from the University of Florida (1989). He was elected to Florida Blue Key and Savant UF honor societies.

Kyle earned his Professional Education Certificate in social sciences while attending Florida Atlantic University (1993). The following year he taught social sciences at Andrew Jackson High School in Jacksonville, Florida. An interest in special needs students led to certification in special education. He taught special needs students over the next four years.

In 1998, Kyle was accepted into the graduate program in school psychology at the University of Florida. While pursuing his degree, Kyle worked for three years as a teaching assistant in the Department of Educational Leadership, Policy, and Foundations. Kyle also worked for one year as a research assistant in the Department of Special Education. In 2001, Kyle was awarded Master of Arts in school psychology and admitted to candidacy for Doctor of Philosophy in school psychology.

Kyle completed his doctoral internship in school psychology in 2002 at the Department of Psychological and Diagnostic Services in the Hillsborough County Public School District. After completing his internship, Kyle accepted a position in the Hillsborough County Public School District. He currently is a school psychologist working at Van Buren Middle School and Gaither High School in Tampa, Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Thomas Oakland, Chair
Professor of Educational Psychology

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Tina Smith-Bonahue
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This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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